

Flow

THE MAGAZINE WHICH INTEGRATES MATERIAL HANDLING EQUIPMENT INTO THE FLOW OF PRODUCTION

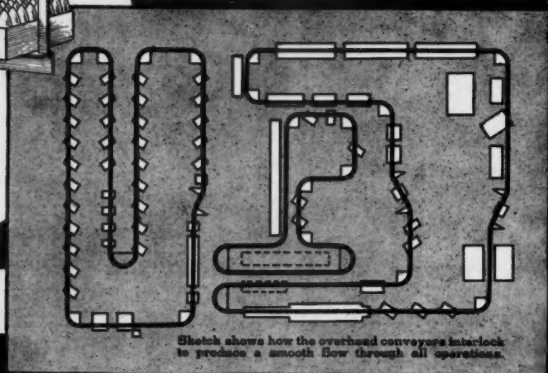
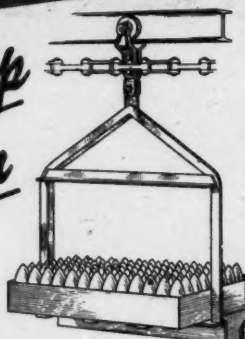


THE UNIVERSITY
OF TEXAS
OBTAINING
THE LIBRARY

EFFICIENT HANDLING OF MATERIALS SPEEDS PRODUCTION FLOW

*70 Step-Up
Production*

**of 40mm
Armor-Piercing
Shot...**



LAMSON

Co-ordinated **an Electric Fan Factory!**

From electric fans to cool a world at peace—to ARMOR-PIERCING SHOT to conquer the enemy in a world at war, was the conversion demanded of one large Eastern factory. Complicating an efficient change-over were the more than thirty operations which must be performed in production alone, to manufacture the shot.

THEN LAMSON ENGINEERS WERE CALLED IN. They recommended a series of overhead conveyors which picked up the work at the receiving department and carried it steadily, smoothly through more than thirty operations to the shipping room. Inspection stations received and dispatched their allotments as the work passed—and, always, the conveyors served as live storage!

The mechanization of war will guide us in producing for Peace. The experience of LAMSON is at your disposal! The booklet—"CASE HISTORIES—To Aid You in Blueprinting Conversion to Peace"—is filled with factual, diagrammatic stories of how others have attained new peaks of production through Lamson Coordination.



SEND COUPON FOR YOUR COPY TODAY!

**LAMSON
CORPORATION**

1300 Lamson Street
SYRACUSE 1, N. Y.

LAMSON CORPORATION
1300 Lamson St., Syracuse 1, N. Y.

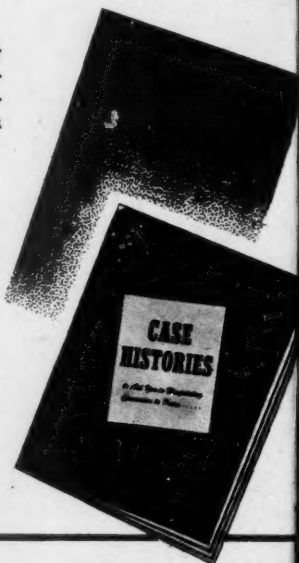
Please send me a copy of your reconversion booklet. I would like to see what your planning assistance has done for others.

Name.....Position.....

Company.....

Address.....

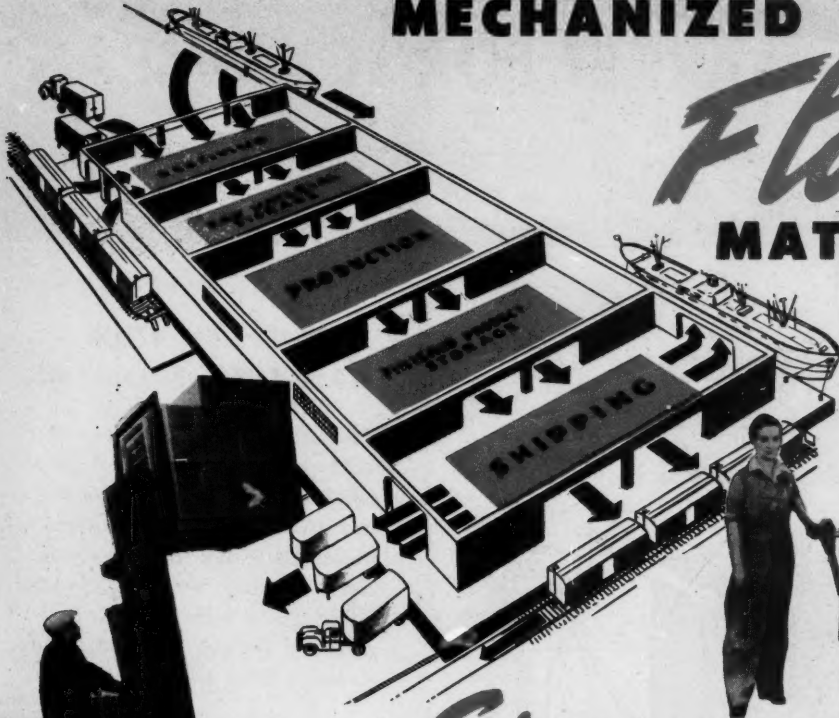
City and Zone.....State.....



AUTO
rials f
the fi
your
help y
ations
materi
cessive
to sto
ment.
Plea
may s
the ne
neered
survey

MECHANIZED

Flow OF MATERIALS



AUTOMATIC TRANSPORTER
MOTORIZED HAND TRUCK

Gives you

LOWER UNIT COSTS...

Management is now compelled by competition to utilize men, methods, materials and machines in a manner to achieve lowest production cost and sales price per unit.

While processing motions usually add value to a product, handling motions add only to its cost.

You can lower your unit costs if you will team up AUTOMATIC's battery-powered Fork Truck with the war-tested "TRANSPORTER," AUTOMATIC's service-proved, motorized hand truck,—and apply AUTOMATIC's Engineered Materials Handling Methods.

AUTOMATIC's completely Engineered Materials Handling Service will do these things for you:

1. Eliminate costly manual handling.
2. Reduce damage to materials handled.
3. Increase storage capacity by safe, vertical stacking of materials to rooftop.
4. Simplify inventory control.
5. Increase productivity by reducing labor fatigue.
6. Reduce accidents.

Please write us now so we may schedule your plant for the next AUTOMATIC Engineered Materials Handling survey in your area.

MANUFACTURERS OF *Electric* INDUSTRIAL TRUCKS SINCE 1906

AUTOMATIC TRANSPORTATION COMPANY

Division of the Yale & Towne Manufacturing Company

[41] West 87th Street

Chicago 20, Ill. U. S. A.

Specialists in developing ENGINEERED MATERIALS HANDLING TO LOWER UNIT COSTS

OCTOBER, 1945

BOUND

JUN

1947

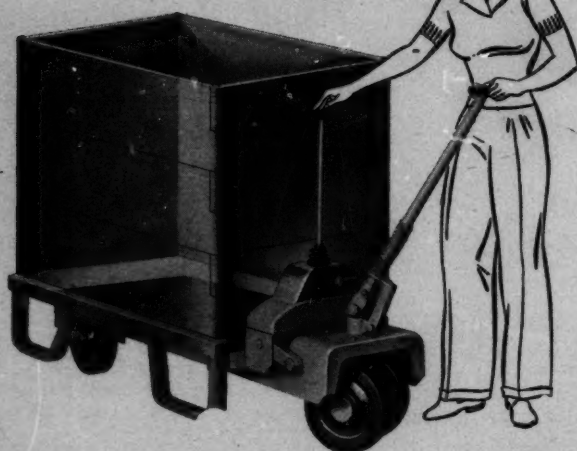
1



Announces

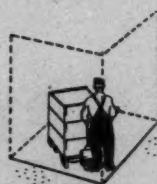
LOAD-LIFTS

SEND FOR LOAD-LIFT
MANUAL No. 1005MH



SIMPLIFY YOUR HANDLING PROBLEMS

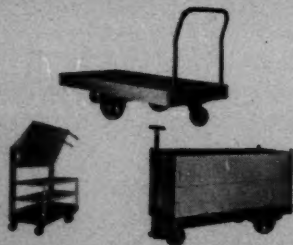
The use of the Load-Lift system will greatly increase your plant efficiency for the smallest capital investment of any adequate materials handling system. Saves double handling — utilizes space advantageously — reduces fatigue — eliminates damage from elements.



MANY EXCLUSIVE OPERATIONAL FEATURES

LOAD-CARRIERS

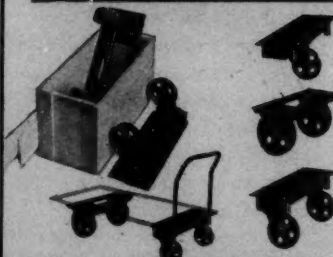
SEND FOR LOAD-CARRIER
MANUAL No. 1003MH



Standardized Load - Carriers, equipped with deep stake pockets at each corner make possible the complete conversion of the truck by the addition of standard accessories. Custom built trucks are also available in stainless steel, aluminum and Monel Metal.

LOAD-PACS

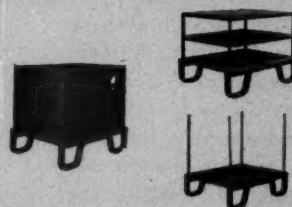
SEND FOR LOAD-PAC
MANUAL No. 1002MH



Many sizes and styles of trucks may be built with pre-assembled running gear called LOAD-PACS. Standardize on one size running gear — use it over and over again. LOAD-PACS are shipped as knocked down truck parts. Rapid shipment — less freight.

LOAD-SKIDS

SEND FOR LOAD-SKID
MANUAL No. 1006MH



Available in all sizes — capacities from 2500 to 20,000 lbs. Load-Skids may be purchased in steel, stainless steel, Monel metal, or hard wood, metal bound at vital points. Load-Skids and Load-Lifts combined make one of the most efficient materials handling and storage systems in existence.

MARKET FORGE COMPANY · MATERIALS HANDLING DIVISION

STANDARDIZED

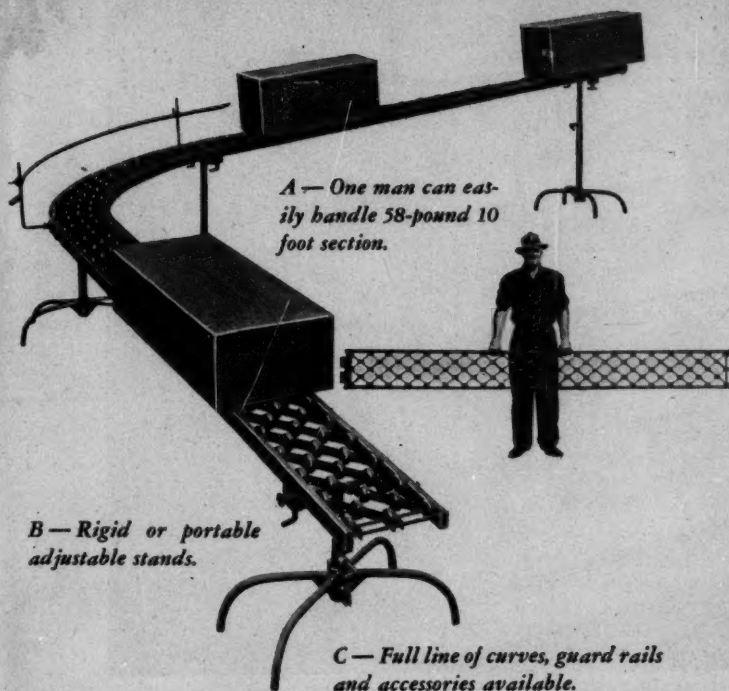
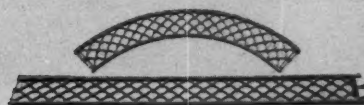
LOADING EQUIPMENT

LOAD-VEYORS

SEND FOR LOAD-VEYOR
MANUAL No. 1003MH

A MAGIC CARPET FOR INDUSTRY

Load-Veyors combine great strength and light weight. Exclusive Market Forge features . . . grid construction supports ball bearing rollers on both sides . . . hardened inner and outer ball bearing races minimize wear . . . Load-Veyors may be used on either side . . . rails on reverse side provide for safe conveyance of small packages.



A — One man can easily handle 58-pound 10 foot section.

B — Rigid or portable adjustable stands.

C — Full line of curves, guard rails and accessories available.

SEMI-SKIDS & JACKS

SEND FOR SEMI-SKID & JACK
MANUAL No. 1007MH



Where materials must be moved freely in small quantities at low cost, use Market Forge Semi-Skids and Jacks. They ship compactly in motor trucks — handle and stack easily when empty. Suitable super-structures are available.

LOAD-MOVERS

SEND FOR LOAD-MOVER
MANUAL No. 1001MH



Since 1897 Market Forge Co. has produced casters as integral parts of their industrial trucks. Continued improvements have resulted in the most durable and efficient caster it is possible to produce. Load-Movers assure standardization of running gear on truck fleets.

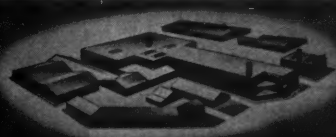
DISTRIBUTORS

We offer to established Mill Supply Companies and Industrial Distributors a completely integrated and standardized line of Materials Handling Equipment.

Territories are now available throughout the country and insofar as possible on an exclusive basis.

The position of Materials Handling during the period of re-conversion and after will surpass its importance during the war.

NOW — is the time to consider a profitable addition to your lines of standardized industrial equipment. Write TODAY!



60 GARVEY ST., EVERETT 49, MASSACHUSETTS



EVERY SHIPPING UNIT IS THE SAME EFFICIENT SIZE when small packages, or loose parts, are PALLETIZED. Stanley Steel Strapping binds these trays of airplane engine parts to a wooden platform, thus simplifying the tremendous task of packing and shipping.

TIME-SAVER...

for an ENTHUSIASTIC Industry

Stack the pallets—or trays—high as you want...bind them with tough Stanley Steel Strapping...and quick as that you have a safe, sturdy, weight-saving unit ready for shipment.

That's how Pratt & Whitney Aircraft uses Stanley Steel Strapping for packing airplane cylinders...because the aircraft industry can't wait for time-consuming, old-fashioned crating where modern strapping will serve.

And when a Stanley-strapped pallet load arrives, time is saved again. None is wasted in nail-pulling or counting contents. Handlers just cut the strapping, stack the trays in stock. Also with Stanley Steel Strapping used to bind the load, danger of damaging castings by careless nailing is eliminated.

Use Stanley Steel Strapping. You'll save packing materials as well as time! The Stanley Steel Strapping System includes tools, reels and accessories.

THE STANLEY WORKS **STANLEY**

Steel Strapping Division... New Britain, Conn.

EX
SM

Lifting
ing and
costs an
electric

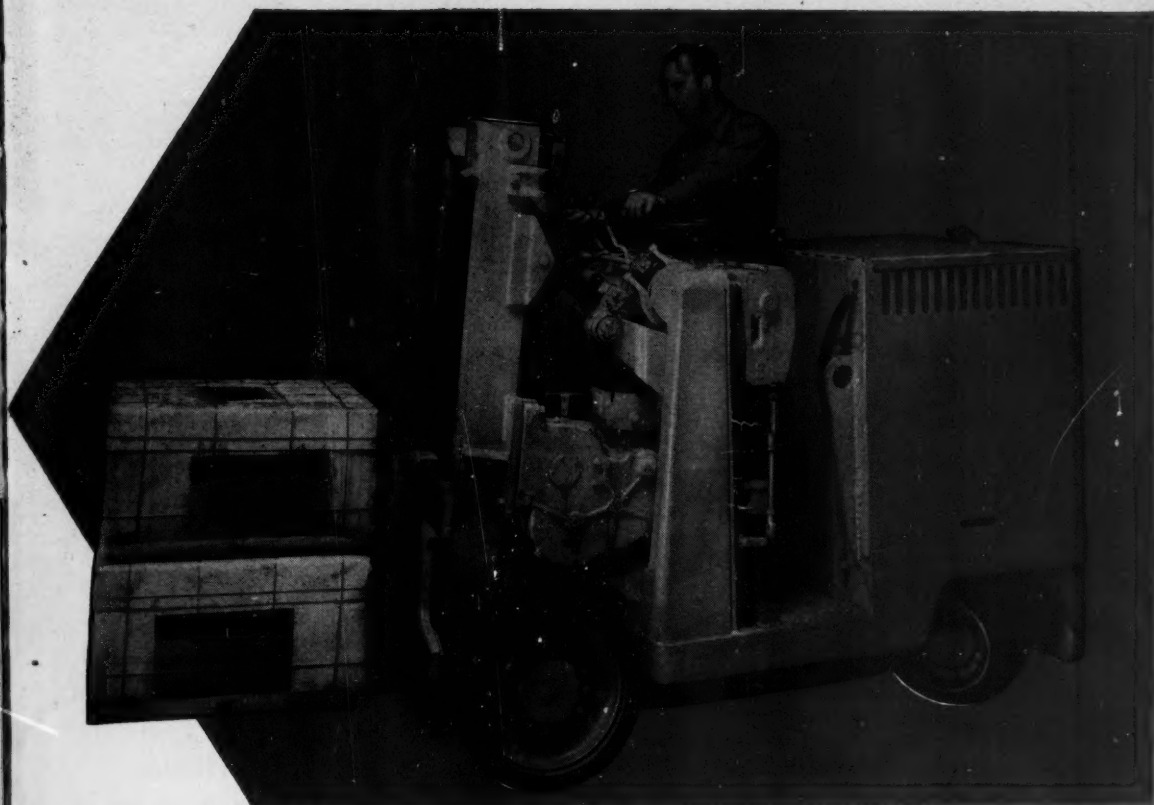
When y
powered
after day
stay stea
performa
hat mak
he most
When yo
life and

Write us
prepared
on. It to
... covers
ling...

THE ELE

FLOW OCTO

EXIDES HELP TO KEEP MATERIALS MOVING SMOOTHLY, STEADILY, ALL DAY LONG...



Lifting and shifting, loading and unloading, hauling and stacking—the lowest materials handling costs are assured when unit loads are handled by electric industrial trucks.

When your electric industrial trucks are Exide-powered, you can count on *full shift availability* day after day. There is no costly down time, for Exides stay steadily on the job, delivering the same efficient performance during every working hour—a factor that makes Exide-powered electric industrial trucks the most economical of all materials handling units. When you buy an Exide you buy dependability, long-life and ease of maintenance.

Write us for a FREE copy of the bulletin "Unit Loads," prepared by The Electric Industrial Truck Association. It tells how to cut handling costs up to 50%... covers latest developments in materials handling... and includes actual case histories.



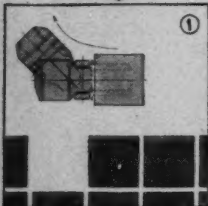
Exide
BATTERIES

THE ELECTRIC STORAGE BATTERY CO., Philadelphia 32 • Exide Batteries of Canada, Limited, Toronto

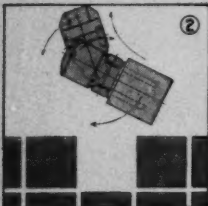
LOW OCTOBER, 1945

New Baker ARTICULATED Fork Truck cuts aisle requirements

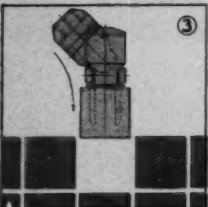
How the BAKER ARTICULATED FORK TRUCK saves time and space placing loads



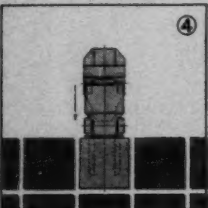
1. The driving section swings away from the load spot.



2. Both sections rotate about 25 degrees around turning center.



3. Truck articulates, lining load perpendicular to aisle.



4. Truck moves forward, spotting load in position.



Revolutionary new principle increases available storage area.

A basically new design* involving a new method of steering by "articulating" the frame, permits swinging the load to line it up in position without lining up the truck itself. Thus this truck requires about two feet less space for placing loads at right angles to aisles. It needs less clearance on turns, and speeds carloading or any other handling operation where loads must be lined up or positioned in congested areas.

Specific advantages of this truck are:

1. Works in narrower aisles.
2. Turns in a smaller radius.
3. Spots loads quicker and easier.
4. Control units are more accessible.
5. Simpler Steering design cuts maintenance.
6. Permits mechanization of handling where hand trucks were necessary because of space limitations.

Field tests in both warehouse and production operation have proved the many advantages of this new truck. For complete specifications request Bulletin 1330.

*Licensed under Stevenson Patent No. 2,204,127.

Designed primarily for efficient warehouse operation



BAKER INDUSTRIAL TRUCK DIVISION of The Baker Raulang Company

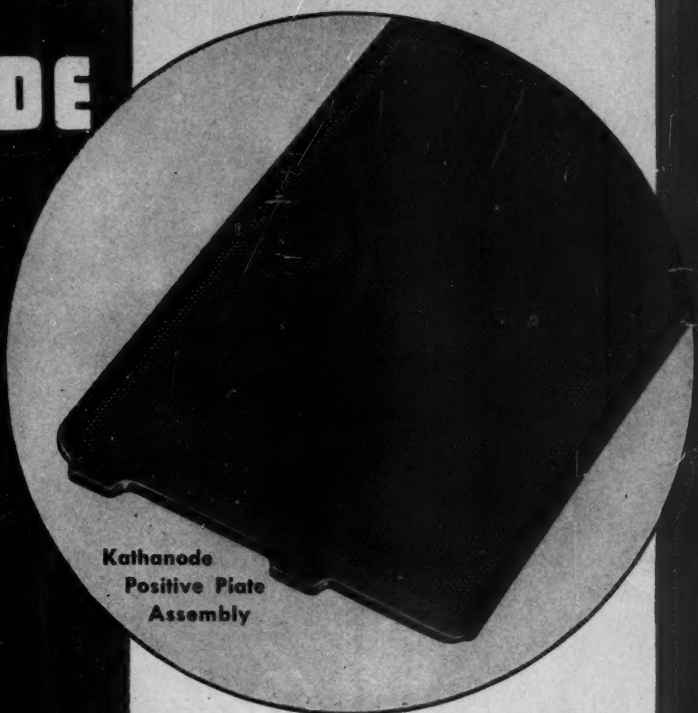
2185 WEST 25th STREET • CLEVELAND, OHIO

In Canada: Railway and Power Engineering Corporation, Ltd.

KATHANODE

Guards

BATTERY EFFICIENCY



Kathanode
Positive Plate
Assembly



GOULD

PIONEER OF GLASSKLAD CONSTRUCTION

Kathanode's exclusive glassklad construction minimizes loss of power producing active material. This means sustained useful power through more hours of trouble-free performance in your industrial truck.

Look at the Kathanode unit pictured above. Note how the plate extends below the mats and open-end envelope. Minute, spent particles of active material, filtering down through the mats, fall freely into the sediment chamber. There is no obstruction to cause them to lodge or tree. They cannot create short circuits and other internal cell losses.

Note also how the perforated rubber envelope holds the spun glass mats against the plate. No useful active material can escape. Capacity is maintained.

Kathanode reduces industrial truck power costs. Write Dept. 1810 for Catalog 100 on Gould Kathanode Glassklad Batteries for Industrial Truck and Tractor Service.



U.S.
Load-rated
**INDUSTRIAL
TIRES**

The right Tire for every job!



UNITED STATES RUBBER COMPANY

Serving Through Science

1230 Sixth Avenue • Rockefeller Center • New York 20, N.Y.

For
parec
ation
assist
probl



WRIGHT

HIGH LIFT TRUCKS

are available

IN A WIDE RANGE OF MODELS and PLATFORM ELEVATIONS

THIS company was the original manufacturer of industrial electric trucks and the name **WRIGHT** has stood for the acme in construction, ease of operation and serviceability for over a quarter of a century. We were not only the first to manufacture the (Elevating Platform type) small industrial electric truck but in addition the small Carrying, High-Lift or Tiering and Telescoping models.

Today we offer a full line of small trucks which will do any of the work of the so-called larger trucks and these are available in a wide range of models, capacities and specifications. Our catalog illustrates and describes the various models. *Write for your copy for reference.*

SPECIAL MODELS

For special applications we are prepared to furnish trucks which are variations from the standard line. Let us assist you with your materials handling problems.



WRIGHT INDUSTRIAL TRUCK CO., INC.



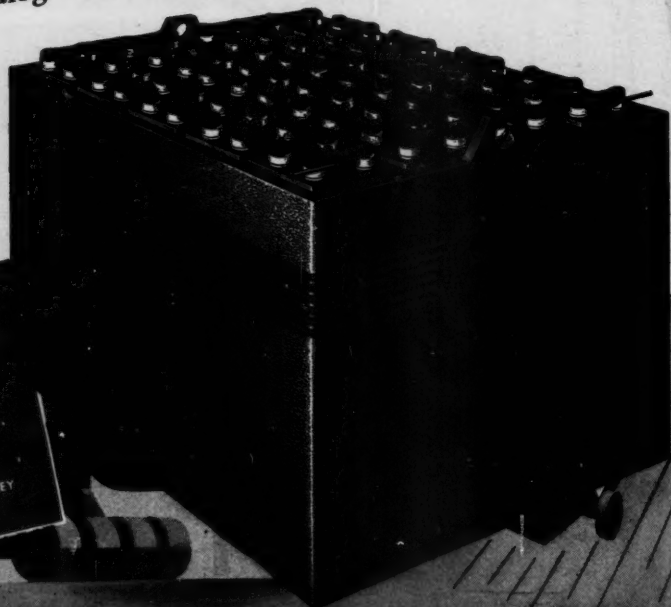
LOOK WHAT
PHILCO
"THIRTY"
CAN DO
TO REDUCE YOUR PRESENT
MATERIALS HANDLING COSTS

To the safety, flexibility and operating economy of modern electric trucks—now add the 30% longer life of Philco "Thirty" Storage Batteries. Here's the combination that keeps materials moving—and keeps costs *down*. As proved by years of service on the toughest jobs, Philco "Thirty" lowers handling costs. Write for new catalog of specifications and engineering data.

The new Philco "Thirty" for electric industrial trucks is identified by its distinctive red connectors.

PHILCO
Famous for Quality the World Over

PHILCO CORPORATION
STORAGE BATTERY DIVISION, TRENTON 7, NEW JERSEY



Flow

The magazine which integrates material handling equipment into the flow of production.

OCTOBER
1945

In this issue

What makes FLOW—the publisher's statement	13
855 = 50—A Study in Modern Production Arithmetic	14
A Model PLAN for Efficiency	17
Bringing a SIDE SHOW Into the MAIN TENT	18
FLOW Breaks a Bottleneck	24
EASY DOES IT—If You Are Handling Heavy Pieces	34
The Care of WIRE ROPE	38
Off the Shipping Platform	45
Does FLOATING STORAGE Solve Your Problem?	48
Oldest Industry . . . NEW IDEAS	50

On the Pallet—news, views, trends...	27
The Flow Classroom—studies in material handling instruction.....	41
Keep Them Rolling—maintenance hints for your files.....	47
New Products—equipment of interest.	54

Smaller Plant and Shop Problems.....	58
Men in the News—material handling men move	59
New Literature—free material from manufacturers	61

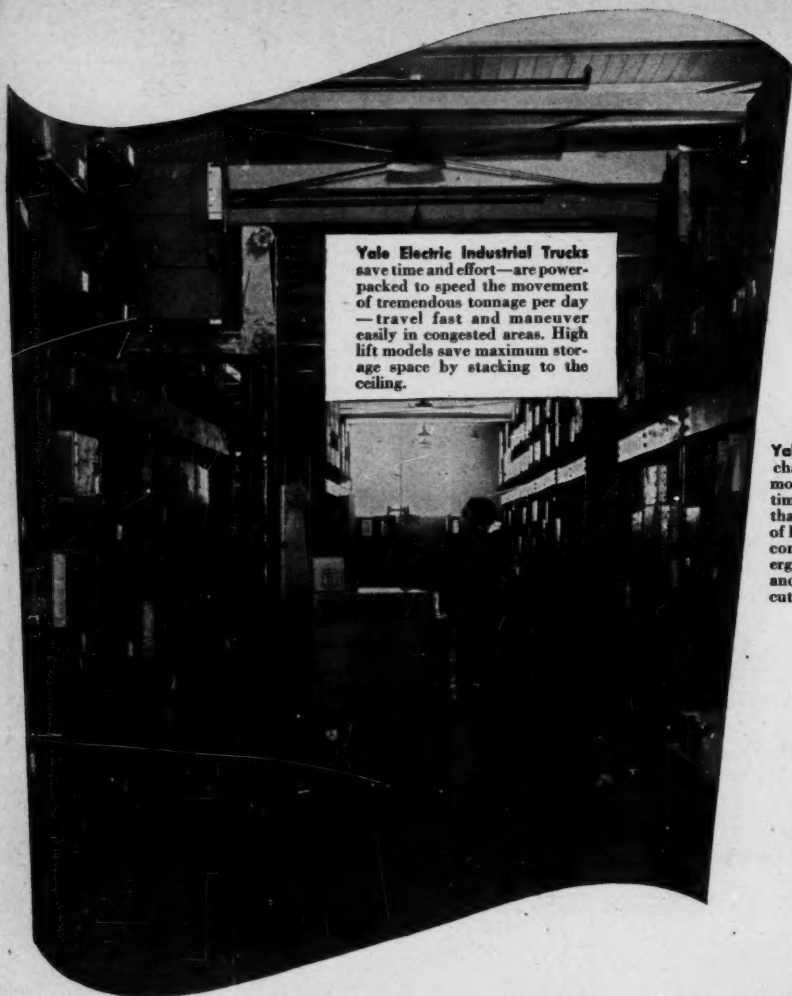
The Staff—CURTIS H. BARKER, JR., Consulting Editor; MANFRED SCHUELER, Editor; C. BERENS, Associate Editor; WM. V. LINAS, R. EVERETT, ARTHUR A. BOUHALL, NORMAN TAYLOR, Production Department; L. N. FLINT, B. WOLFE, B. FRITCHIE, Special Service Department; E. J. HEXTER, I. GRABOWSKI, E. KOBLINTZ, V. JAN-
NING, C. BELL, Circulation Department.

FLOW EDITORIAL AND BUSINESS OFFICES—
812 Huron Road, Cleveland 15, Ohio
NEW YORK OFFICE—CHESTER RICE, 60 E. 42nd
Street, Room 950, New York 17, New York. Mur-
ray Hill 2-0488
CHICAGO OFFICE—NORMAN J. LOTT, 612 N.
Michigan Avenue, Room 513, Chicago 11, Illinois.
Superior 2919

SUBSCRIPTIONS—By the year, \$2.00; Two years, \$3.50; Single copy, 25 cents.
FOREIGN SUBSCRIPTIONS—Canada, \$3.50; Foreign, \$4.00.

Copyright 1945 by THE BOLIVAR PUBLISHING CO., Cleveland, Ohio. Published Monthly by THE BOLIVAR
PUBLISHING CO., Cleveland, Ohio. IRVING B. HEXTER, President. LESTER P. AURBACH, Vice-President.

THE COVER—Three-dimensional models, accurate to 1/4" per ft. scale, used in planning the layout of a rocket
projectile line. The use of models, rather than 2-dimensional templates, makes for clear understanding by
engineering, management and service officials. See story on Page 17.

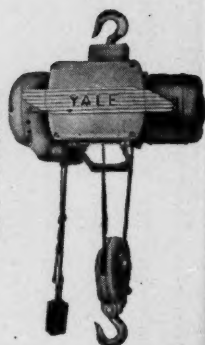


Yale Electric Industrial Trucks save time and effort—are power-packed to speed the movement of tremendous tonnage per day—travel fast and maneuver easily in congested areas. High lift models save maximum storage space by stacking to the ceiling.



Yale Hand Lift Trucks are ruggedly built for long life—provide easy lift, easy roll, easy steer—take the shorter hauls at a fast clip. Wide range of models and capacities for handling skids, skid bins, and pallets.

Yale Hoists—hand chain and electric models—are efficient time and labor savers that make light work of heavy lifting jobs—conserve worker energy, speed production and cut handling costs.



Kron Springless Dial Scales, made by Yale, eliminate excessive time and money-wasting handling operations, provide accurate, efficient, low-cost weighing and counting of all kinds of materials. Available in all types from bench to crane scales.

Use "AIR RIGHTS" TO CUT PRODUCTION COSTS

Utilize every cubic foot of air in your storage areas and warehouses and you eliminate *hidden costs* that boost the cost of production. You can do it with Yale High Lift Trucks. These powerful lifting and transporting machines operate smoothly in congested areas, spot loads precisely, tier to the ceiling, remove selected items with minimum effort and with maximum efficiency and safety . . . reduce rehandling operations, facilitate processing and shipment, and simplify inventory control.

The complete line of cost-cutting Yale Materials Handling Machinery provides a broad range of easy-to-use, "safety first" electric and hand lift trucks, hand and electric hoists, and scales, in types and capacities to satisfy the handling needs of every type of plant, large or small. Learn how you can achieve greater production economy. Phone our nearest representative for details, or write to The Yale & Towne Manufacturing Co., 4530 Tacony Street, Philadelphia 24, Pa.

MATERIALS HANDLING MACHINERY
CUTS PRODUCTION COSTS . . . SAVES TIME . . . SAVES EFFORT . . . PROMOTES SAFETY



HOISTS—HAND AND ELECTRIC • TRUCKS—HAND LIFT AND ELECTRIC • KRON INDUSTRIAL SCALES



What Makes *Flow*?

HERE is the first issue of an eventful, new magazine. It is momentous because FLOW is geared to the one thing that has made America great—the *flow* of materials in production.

When Henry Ford first announced his improved continuous production line, he unwittingly introduced *flow* to American industry.

Today, *flow* is industrial America; it has opened up new horizons of better production, improved efficiency, and lower unit cost. Thus, this magazine comes aptly named into a realm already made outstanding by past fabulous performances.

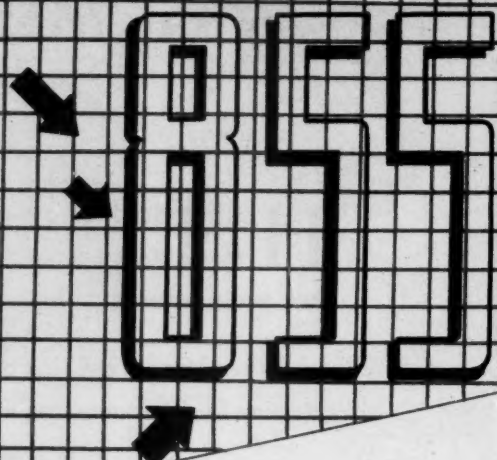
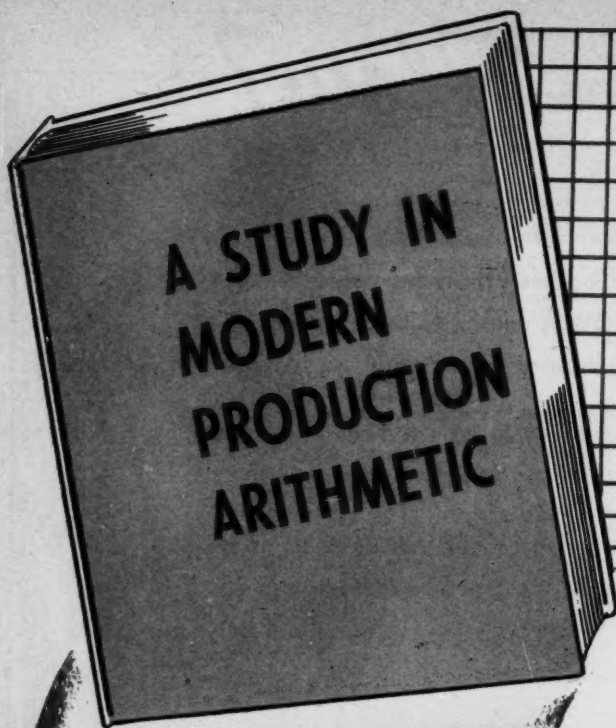
FLOW is dedicated to the stimulation of the whole material handling field—through study, exposition, and education—in an effort to make industrial America even stronger and more productive. Its pages will be devoted to showing better, faster, and more economical ways of integrating materials handling procedures into the flow of production. FLOW will show better methods of storage, warehousing and stock keeping. The variety of methods and industries covered in this issue gives only an inkling of the scope of subjects and procedures that will be treated in ensuing issues.

FLOW does not mean only getting materials to the right place and at the right time. Proper production flow also means accurate, easily understood records, well-kept parts stock rooms, easily accessible machine tool parts, dies and patterns. Flow also means a completely flexible pool of manpower. Instant communication between members of an organization contributes to such flexibility.

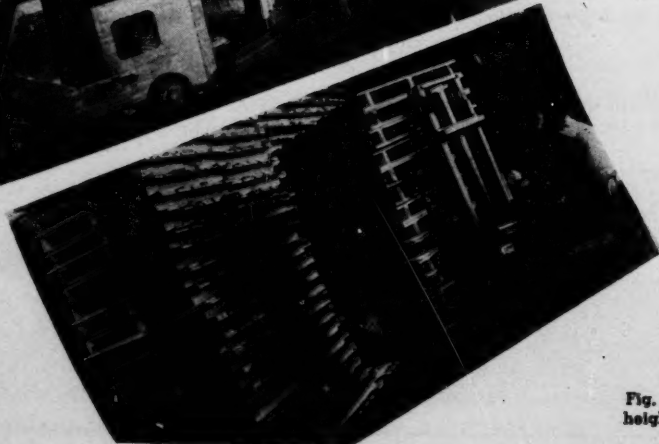
FLOW will cover every aspect of material handling in industry. To this large and important purpose do we dedicate ourselves.

Irving B. Hexter

PUBLISHER



When 855 shipping boxes were reduced to 50 strapped palletized loads, man-hours were cut 65%. The products arrived in sound condition after world-wide travel.



WHEN the Bryant Heater Company reduced 855 boxes to 50 palletized unit loads in conformance to the Navy-developed standard shipping procedure, it not only found a way to accelerate the Navy's shipping schedule but also eliminated about 90% of the boxes formerly used. Our company, in normal times a manufacturer of industrial and domestic gas heating equipment, assembled and prepared for export shipping bogie wheel suspensions for the amphibious landing craft popularly known as "water buffalo." (L.V.T.—Landing Vehicle Tracked.)

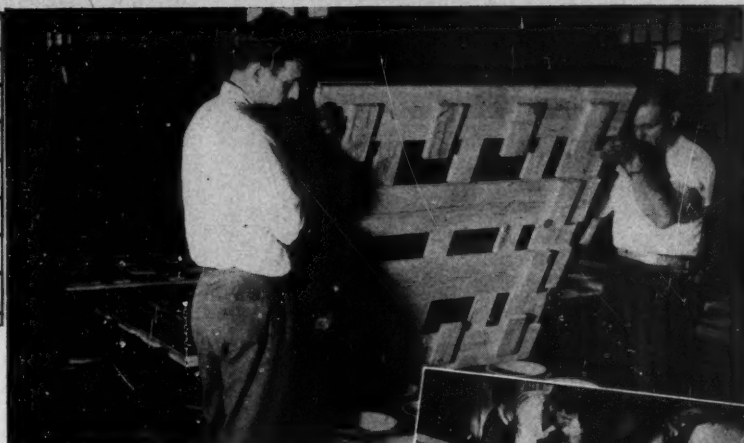
The Navy schedule required the packing and loading of from 20 to 30 freight cars of LVT spare parts a month. Originally the tires and wheel and torsilastic arm assemblies were boxed and loaded individually—a "loose pack-

Fig. 1 (top)—Miscellaneous assembly parts arrive from various suppliers in box skids and loose units—leave plant in neat, palletized loads.

Fig. 2 (center)—A load is pulled by a power truck from the receiving room to assembly line.

Fig. 3 (left)—A fork lift truck stacks pallets to height of 14 feet, conserving floor space in the warehouse.

50



By **HARRY F. PRAH**

Plant Engineer
Bryant Heater Co.



Fig. 4—A palletized load of tires, stacked two high, is assembled. 1" thick blocks nailed to the top and bottom pallet frames prevent the units from sliding. The pallet is then strapped. Below, Strapping the complete pallet.

age" method that required an excessive amount of handling, man-hours, and materials. The average freight car load comprised 855 individual boxes! The preparation of the hundreds of units for a single car, including loading, required three working days.

When the company adopted the pallet method of packing and shipping about a year ago, some of the following results were noted. The packing and loading time per freight car was reduced from three days to only one day. Example of the time saved in a particular operation: Whereas it previously required eight men eight hours to load and brace one car, the same operation was completed in the new manner by three men in three

hours. Other specific gains are discussed in a later paragraph.

Palletizing Spare Parts

All component parts arrived by highway truck or trailer. The larger parts were received loose in bulk quantities and loaded on industrial trailers. These were hitched to a fork truck and hauled either to temporary storage or to the assembly line. Smaller component parts, packed in corrugated boxes, were loaded on pallets and moved to the assembly in unit loads. The empty pallets arrived by freight car. These were unloaded by fork lift truck and hauled by it to a temporary storage area adjoining the packing and shipping department, where they were stacked to a height of 14 feet.

The finished assemblies and processed small component parts were brought by chute and roller conveyor to two opposite ends of the packing and shipping floor. Wheels and tires arrived by chute at the west end, arms and boxes of component parts by roller conveyor on the opposite side.

As the tires, wheels, arms, and boxes were taken off the chutes and rollers, they were stacked by hand on the pallets. The loaded pallets were then lined up for packing a

Fig. 5—Complete wheel assemblies with protruding axle housings are nested. The procedure is: (1) Bottom wheel frame consisting of 2" x 4" stringers with no cross boards is placed on pallet. (2) Wheels are stacked on frame four deep and four across, with axle housings between stringers, which are spaced 6" apart. (3) Top wheel frame is the same as bottom frame, with exception of having four cross boards, required for dunnage and strapping purpose. Loaded pallet weighs approximately 1400 lbs.

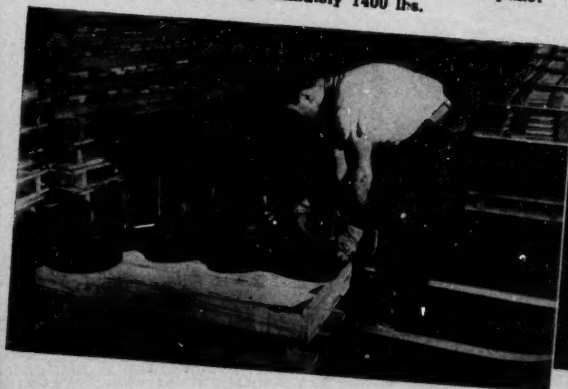


Fig. 6—Odd shaped arms are packed in one layer and strapped within themselves to prevent shifting. Entire loaded pallet weighs approximately 1970 lbs.





Fig. 7—A pallet of wheel assemblies is loaded into a boxcar. Loading was formerly done by 8 men in hand-to-hand operations requiring 84 man-hours; this truck, with one man, loads freight car in a little more than an hour.



Fig. 8—Bracing between two rows of pallets and at the end of car. The types of bracing, of course, depend largely on the type of load involved. Chocks, strapping and simple cross wooden boards are commonly used to keep loads from shifting.

few feet away, which permitted the loading operation to continue without a break.

Caps were placed upon the loose palletized assemblies, bracing was applied, and the units were then strapped. The loads, weighing from 1400 to 1970 pounds each, were moved by fork lift truck either to temporary storage or directly into the freight car positioned a few feet away at the loading dock.

Boxes, arms, and tires were stacked directly on the pallets. Specialized handling, however, was required for the complete wheel assemblies. For these, special frames were provided, top and bottom, to accommodate the axle housings which protruded three inches on each side beyond the rim level. These details, including some other individual handling requirements, are shown in the accompanying photos.

This adaptability of pallets to articles of various sizes and odd shapes, it may be noted in passing, suggests their possibilities for the mass movement of a vast variety of civilian goods.

The average car load consisted of about 50 pallets, which were usually loaded two high. The loading was done entirely by fork lift

truck. (When a "tight spot" made it necessary, the truck could turn around and "bump" any pallet into the desired position.) Because two of the 48" x 48" pallets could be placed side by side in the average freight car, very little space is left between them.

Global Travelers

The benefits of palletizing extended beyond the loading dock. After the unit loads left the assembly plant, the Navy sometimes handled the pallets nine times before they reached their final destination. It readily can be seen how savings accrued at each intermediate shipping point, where

only 50 pallets were handled by fork truck instead of 855 boxes by a "stream of men".

With standardized pallet sizes, Navy transport experts could and did readily prefigure ship loading long before the goods arrived at pierside, a feature which contributed much to optimum ship usage as well as to loading speed.

Across thousands of miles the palletized loads kept moving, by rail, truck, trailer, barge, and ship until they arrived at the advanced bases in the Pacific. Because the final "point of use" not infrequently was a battle area, sometimes under fire, ready accessibility of the

(Continued on page 63)

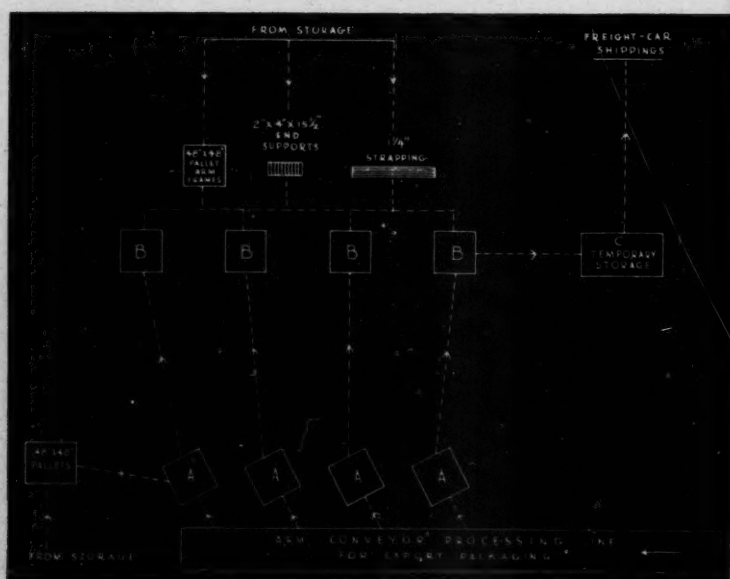


Fig. 9—Torsilastic Arm Assembly Flow Sheet. Pallets are positioned and arms set on the pallets at "A". The partially completed pallet is then moved to "B" for completion with arm frame supports and strapping. "C" is a temporary storage area used in the event that a freight car is not immediately on hand for direct loading.

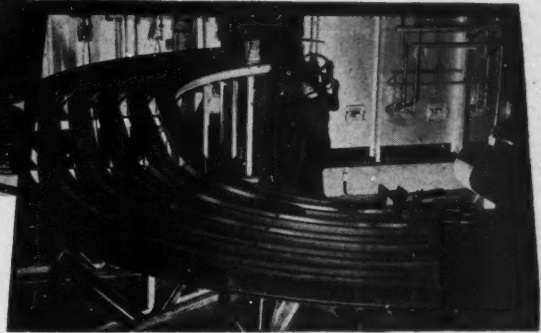
A Model Plan for Efficient Handling



Models of machine tools used in 3-dimensional layout of the production line.

THIS article—about one of the most compact high production areas in the country—may well represent a “wartime lesson” for materials handled in a production line for civilian commodities.

The increasing use of rockets by the Navy necessitated the manufacture of these projectiles in huge quantities. The manufacturing aisle at the Canton Naval Ordnance Plant was designed for straight line flow of this high production item, and all aspects of materials handling were pre-planned as an integral part of manufacturing. These plans not only considered moving the work to and from the stations, but also the handling of incoming forgings and the pack-

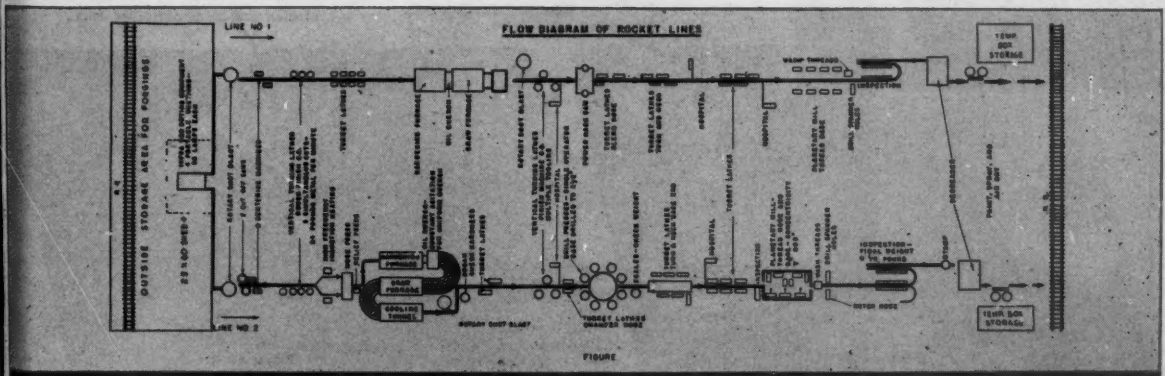


The projectiles pass from the draw furnaces to the air mist cooling chamber. Man-handling is eliminated.

ing and shipping at the end of the line. The latest and best in metal working machines, employed in this project, is aided by comparable handling devices and methods. The rough forgings that enter the production line leave at the other end as finished projectiles, packed in palletized units and loaded in freight cars.

(Continued on page 52)

Flow diagram of the rocket lines. The storage area on the left is bisected by railroad spur. Packing and loading stations are located at the right of the diagram.



BRINGING A *SIDE SHOW* INTO THE MAIN TENT



Here's how an underground conveyor solved a production problem when the plating department had to be moved to a separate building, 250 feet away. 420,000 pieces are moved every day.

By O. B. PATTON

Plant Layout Engineer
Cleveland Graphite Bronze Co.

A LITTLE more than a year ago the electroplating department of the Cleveland Graphite Bronze Company was located in the same room with the thinwall production division, which processes 420,000 sleeve-type automotive bearings daily. The presence of the plating tanks in the processing room was unsatisfactory, for they created moisture and an acid condition in the atmosphere. This tended to rust and corrode the finished parts, as well as the various parts on the numerous machines located on the floor.

Fig. 4—A deflector station in the plating building. This is automatically opened and closed by the ball timer in the main building, shown in Figure 1. Author demonstrates action of deflector arm.

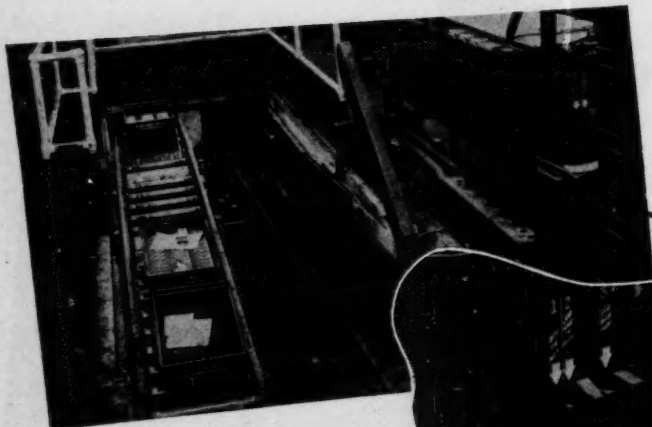


Fig. 1—From the Thinwall Department the conveyor carries tote boxes filled with bearings via the pit to the plating department. The closeup shows the ball timer with three slots; placing of balls in slots controls the transfer of tote boxes automatically in the plating department. See Figure 4.



Fig. 2—Where conveyor emerges from tunnel in plating department. The spur to the first work station in this department is shown on the left.

Fig. 3—This is the transfer point to plating racks. Incoming bearings are racked on a continuous overhead trolley conveyor. Loaded racks are retransferred to the plating machine arms, shown at left. The overhead conveyor carries empty racks back to "racking" station.



con-
prob-
nent
rate
0,000
y.

year
g de
eland
as lo-
h the
which
auto-
pres-
the
tisfac-
re and
tmos-
t and
s well
umer-
floor.

plating
ed and
a build-
demon-

The method of handling between work stations was by stack-type tote boxes, which were transported six at a time by hand trucks.

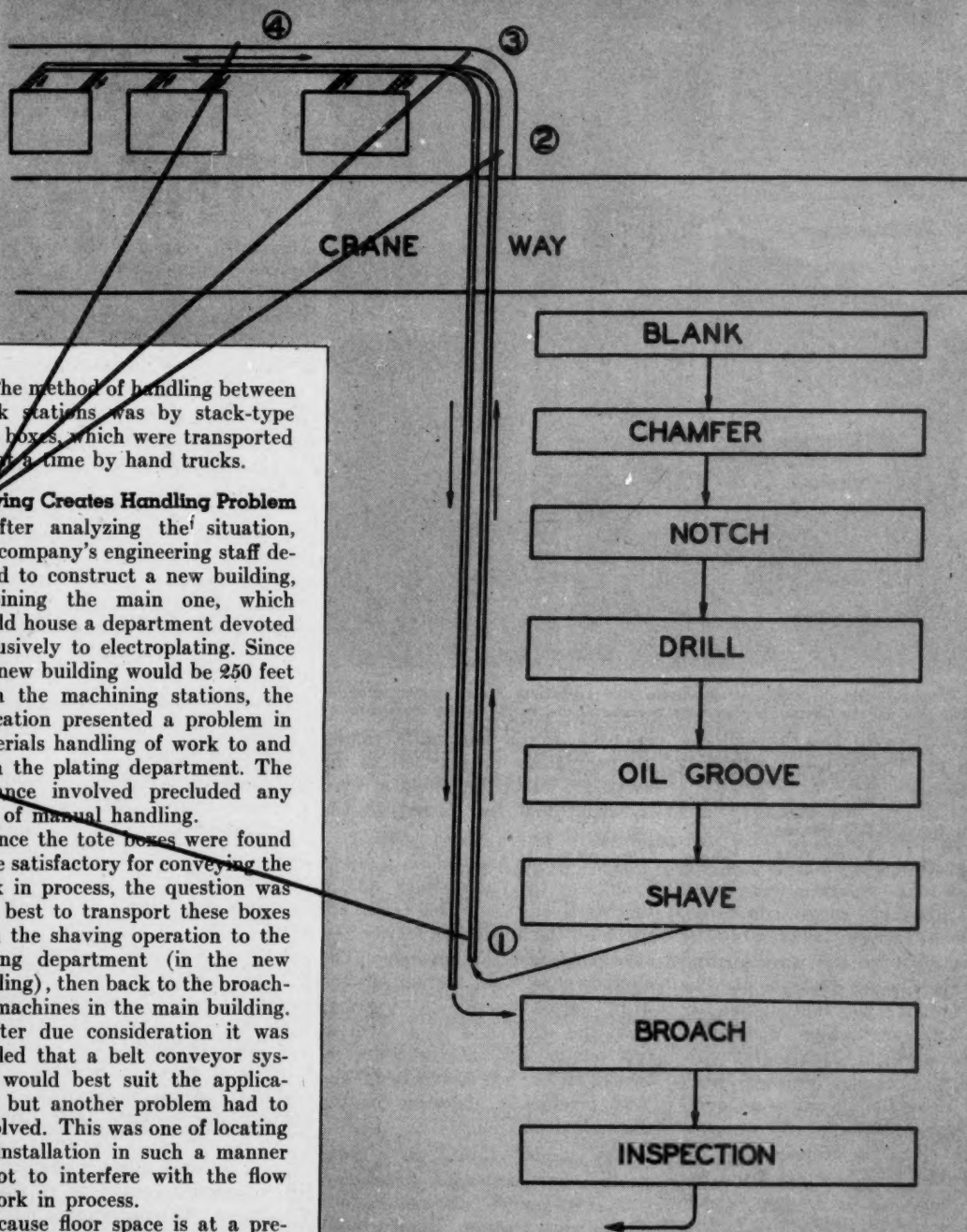
Moving Creates Handling Problem

After analyzing the situation, the company's engineering staff decided to construct a new building, adjoining the main one, which would house a department devoted exclusively to electroplating. Since the new building would be 250 feet from the machining stations, the relocation presented a problem in materials handling of work to and from the plating department. The distance involved precluded any sort of manual handling.

Since the tote boxes were found to be satisfactory for conveying the work in process, the question was how best to transport these boxes from the shaving operation to the plating department (in the new building), then back to the broaching machines in the main building.

After due consideration it was decided that a belt conveyor system would best suit the application, but another problem had to be solved. This was one of locating the installation in such a manner as not to interfere with the flow of work in process.

Because floor space is at a premium in the 1,000,000 sq. ft. plant, the conveyor could not be taken across the floor. Nor was it feasible to route it overhead, due to a crane bay that was located between the two buildings. The new plating building was of the same one-floor type construction as the main plant. Hence the decision was made to lay the conveyor in a pit beneath removable floor sections of an aisle which serviced



Flow diagram, above, shows route traveled by tote boxes from machining operation to plating department, then back to next machining operation. Despite distance, conveyor system ties in the operations satisfactorily and efficiently.

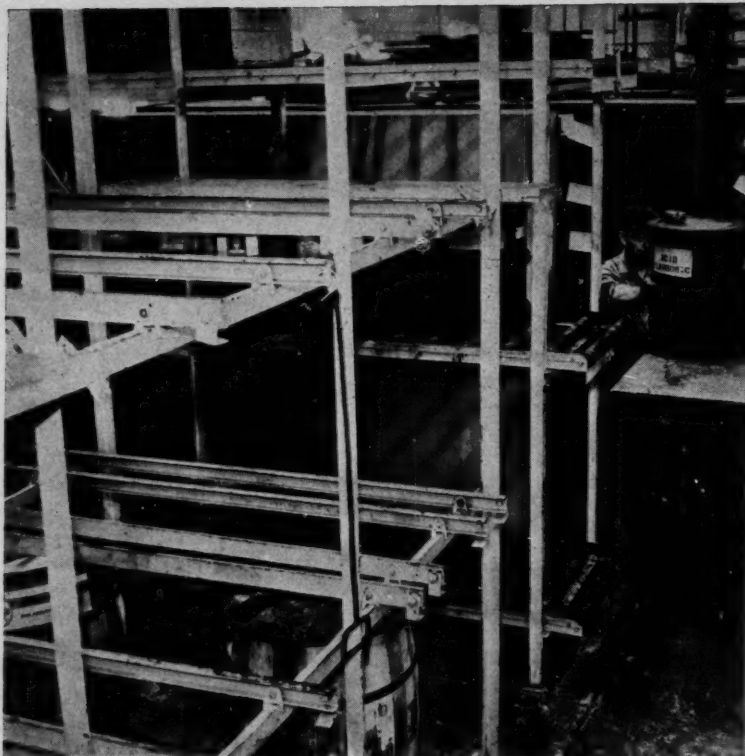


Fig. 5—Storage racks to hold barrels, drums and containers. Note gravity roller in middle section. An elevator is necessary because of the weight of the containers.

work stations in the thinwall department. The pit was constructed 21" deep.

Routing 420,000 Pieces A Day

The complete installation includes four separate conveyors, with auxiliary roller conveyors. There are two 12" belt lines in the pit, which take the work to and from the plating department. The third unit is a 250' long double tier belt conveyor which distributes full boxes in the plating department and carries finished work away. The fourth one is an overhead monorail chain type conveyor which serves the transition operation of loading bearings from the boxes onto the plating trays at the main work station in the plating building.

At the main work station serving the No. 1 plating machine, which does the bulk of the plating, the arriving tote boxes are deflected onto a roller conveyor. This brings the bearings to the workers loading the six-tiered plating trays, which are suspended from the monorail chain and are removable.

The loaded trays move in a circle to a work station immediately

opposite to an automatic carrier of the plating machine. Here the trays are taken off the conveyor by hand and transferred to the plating machine arm.

The dried and plated pieces emerge at the "unloading" side of the work station. The trays are taken off the automatic carrier and again hung on the conveyor. The operators at this section of the work station remove the bearings from the trays and load them in tote boxes. The full boxes are returned on the belt conveyor for the next machining operation in the thinwall department.

The empty plating trays circle on the chain conveyor, which carries them back to the loading side of the work station. Empty boxes from the loading to the unloading side of the station are routed on a roller conveyor.

The double tier 250' belt conveyor in the plating department transports loaded tote boxes to and from the No. 2 and No. 3 plating machines, each of which does a specialized plating job. The upper tier of this belt line takes the tote boxes to the machines, where they are deflected by an arm onto a par-

allel section of a roller conveyor. On the lower tier the plated parts are returned to the thinwall department for the next operation. This tiered conveyor runs at right angles to the underground conveyor. The transfer is accomplished by a 90° curved section of roller conveyor.

Routing Control

A noteworthy feature of the belt conveyor system is the ball timer, located at the head end of the master line in the main building. This control device enables the operator in the thinwall department to route the tote boxes to any of the three work stations in the adjoining building.

For example, if he wants to send a tote box to the No. 3 plating machines, he places a ball in the No. 3 slot of the control mechanism. The travel of the ball in the mechanism is geared directly to the belt travel. Because of this synchronization the deflector arm is thrown only a few seconds before the tote box arrives at the desired deflector station. Thus the flow of work to any station in the plating department is controlled by the timer in the main building.

Auxiliary features: 1—Vocal communication between the two departments is made possible by an autophone installation. By means of this, the supervisor in the plating department can inform the loader in the adjoining building when more work is needed: 2—Heavy barrels and drums of chemicals used for the plating solutions are kept in storage racks located in the department. For easy stacking and removal, several of the shelves on one of the racks are of the roller gravity type. Barrels can be moved on this surface easily. The containers are stacked and removed by means of a portable elevator. This equipment not only saves floor space, but also contributes to good housekeeping and safe handling of the heavy drums and carboys.

Addition Planned

The conveyor system has worked so well that another 88 ft. addition will be installed in the thinwall department. This is to be a feeder line that will take tote boxes to the master line from the far section of the production department. In

The *One* greatest aid to FASTER MATERIAL HANDLING

GENERAL

Industrial Pneumatic TIRE-TUBE-WHEEL UNITS

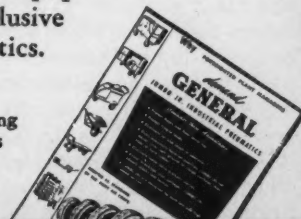
- Obtainable NOW on many types of NEW material handling equipment.
- AVAILABLE in ready-to-install units to modernize present equipment.

The *one* engineering improvement you will see most widely adopted for *postwar* material handling equipment is the General Industrial Pneumatic Tire-Tube-Wheel. For, General Pneumatics have proved that they ease and speed hauling over rough, soft or smooth surfaces, reduce labor requirements, cut equipment maintenance, and stop cargo spillage and floor wear.

General's are the *original* extra-capacity wide rim tire . . . offer the *only* quick demountable wheel . . . are the *standard* chosen for Army Air Corps industrial applications. On NEW equipment . . . or to modernize OLD equipment . . . be sure you get the exclusive advantages of General Pneumatics.

COMPLETE DATA READY

Full information on applications; engineering and design data for use on new products and modernizing old material handling equipment with Generals.



AVAILABLE NOW
8"-22" o. d. 180 to 1900 lb.
capacity per tire.

READY-FOR-USE
Tire-Tube-Wheel Units
and Casters.

The
**GENERAL
TIRE**

Dept. 6, THE GENERAL TIRE & RUBBER CO., Akron, Ohio

Please send the General Industrial Tire Bulletin to:

Name _____

Address _____

Title _____

OCTOBER, 1945

21

fact, the mechanical handling aids have been so satisfactory to production control men in the plant

Mechanically Speaking

A 10' section of roller gravity conveyor is placed to receive the tote boxes at the discharge end of the master line in the main building. In order to prevent damage to the belt conveyor, this roller gravity discharge section is equipped with an overload device consisting of two floating and counterweighted rolls, which, in turn, operate limit switches. These rolls are so spaced that they automatically cut the power from the belt conveyor when the gravity section is full. As soon as the jam on the discharge section is relieved, the power circuit to the belt conveyor is automatically closed and service is resumed. Besides avoiding serious damage to the belt, this device eliminates the necessity of close attention on the part of the operators.

The carrying surface of the conveyors is 4-ply by 12" wide 37½ oz. stitched canvas belting especially impregnated to resist the oil encountered on surfaces of tote boxes. The belts run at approximately 50 F.P.M. on roller bed intermediate sections.

Constant tension is maintained on all belts by means of fully floating automatic counterweighted takeups. This eliminates continual maintenance due to fluctuations in temperature and humidity, which normally results in a "come and go" of at least 2% of the belt length—a major consideration in conveyors as long as these.

Sealed grease-packed bearings are used on the rollers in the pit section of the belt conveyors for protection against intrusion of moisture.

that the new belt line will be welcomed by them without any objection.

The conveyor system has given the company the equivalent of twelve men working an eight hour shift seven days a week. It has also made available 2,000 feet of factory floor space which were badly needed for machinery.

Above all, the installation has introduced to the company in a very pleasant fashion the possibility of reconsidering materials handling operations in the other eight production departments.

DO YOU HANDLE LUMBER?

ARE you handling upwards of 10 cars of lumber that can be stored in the open as long as a week or two? Some plants and yards are modernizing and mechanizing their operations, because savings of up to \$50.00 per car in overall operations have been made. Figure 1 shows a straddle truck. This can be used to handle and

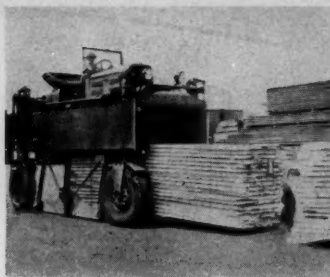


Figure 1.

store lumber that is received in box cars and is to be stored under cover by making up unit loads on bolster blocks.

Figure 2 shows a unit of lumber being loaded into a gondola car.

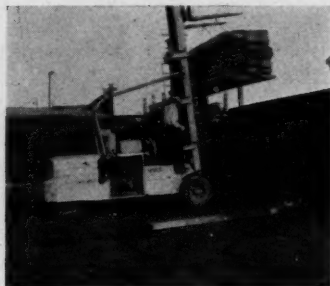


Figure 2.

The load is approximately a four-foot cross section. Dunnage is placed between the drafts for entry of a sling. Note that the slings suspend from the forks (bolster blocks resting against the car in the right foreground and the flat car being unloaded in the rear). The operation of loading lumber drafts in or on open cars, or of placing lumber drafts in storage can also be accomplished by means of overhead or mobile cranes, depending upon other conditions and work loads.

In Figure 3 a fork truck is shown

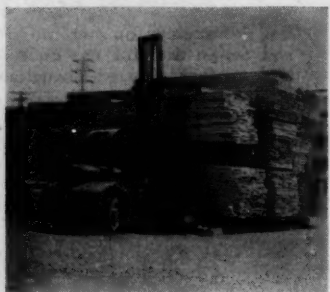


Figure 3

tiering lumber in open storage. While the steel banding is not necessary for lumber of this thickness, in some locations and under cer-

Both light and heavy cranes of all kinds carry rating plates indicating capacity loads, including the outreach where such is a factor. Keeping in mind that cables wear, should capacities be marked on cable slings of the various types, or have you any other suggestions to maintain a desirable factor of safety?

tain conditions this practice has been desirable. Note here that the dunnage blocks are placed on top of the load before tiering to make space for the forks when placing the third tier.—*Courtesy—The Hyster Company.*

CONVERTING?

DURING the period of conversion from a platform skid system to a pallet system one



Figure 1.

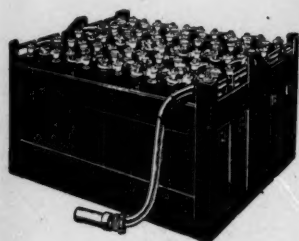
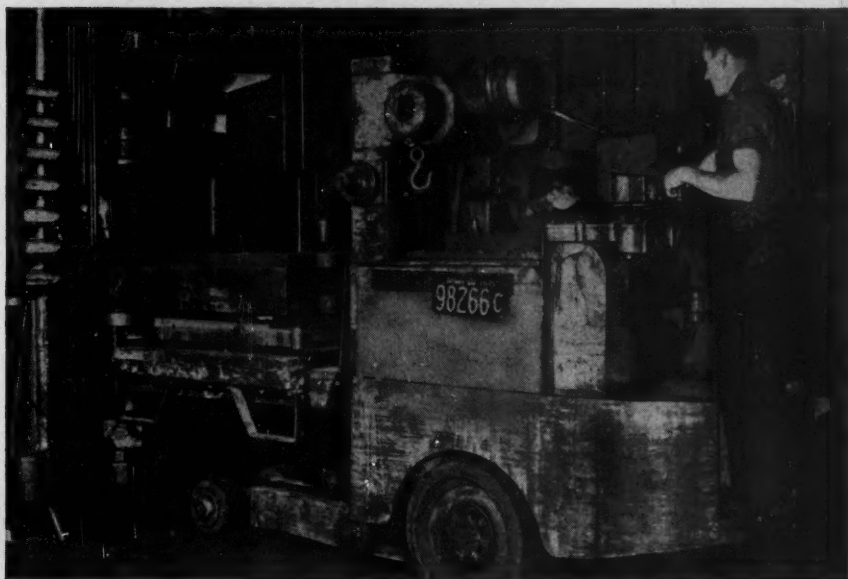
could develop the hand pallet truck and supplementary wooden platform shown in Figure 1. The truck is pushed under the platform and



Figure 2.

then is used to move platform skids around. How this works is shown in Figure 2.

USE BATTERY TRUCKS For Dependable Material Handling



... ALKALINE BATTERIES for Most Trouble-free Power

Time-saving material-handling operations being performed by battery industrial trucks—working 24 hours a day—are enabling all kinds of mills and factories to meet production schedules that seemed “impossible” when set up. Keeping work flowing continuously to and from machines and assembly lines on time, is a stop-and-go job in which battery industrial trucks excel because of their superior maneuverability, high availability and dependable operation.

With batteries exchanged two or three times a day, the truck is kept continuously supplied with power. While one battery is being charged, another operates the truck. Except for the few minutes needed to change batteries, the truck need not stop for servicing the power unit. Its electric-motor drives have a minimum of wearing parts and are inherently simple and trouble-free. The truck starts instantly; accelerates smoothly; operates quietly; gives off no fumes; consumes no power during stops. Not only does

it make efficient use of power but the current used for battery charging is the lowest-cost power available.

Altogether the battery industrial truck is one of the most dependable and most economical methods of handling materials—especially when powered by Edison Alkaline Batteries. With steel cell construction, a solution that is a natural preservative of steel, and a foolproof principle of operation, they are the most durable, longest lived, and most trouble-free of all types of batteries. *Edison Storage Battery Division of Thomas A. Edison, Incorporated, West Orange, New Jersey.*

Edison
ALKALINE BATTERIES

In Industrial Trucks, Alkaline Batteries Give You These Important Advantages

- They are **durable mechanically**; grids, containers and other structural parts of the cells are of steel; the alkaline electrolyte is a preservative of steel.
- They **withstand temperature extremes**; are free from freezing hazard; are easily ventilated for rapid cooling.
- They are **simple and easy to maintain**.
- They can be **charged rapidly**; gassing cannot dislodge the active materials.
- They are **foolproof electrically**; are not injured by short circuiting, reverse charging or similar accidents.
- They can **stand idle indefinitely** without injury. Merely discharge, short-circuit, and store in a clean, dry place.



Figure 1. Bases of tomatoes are delivered by the conveyors to processing rigs like this one, where preliminary sorting and cleaning operations are made.

- Huge tonnages of perishables are received during a short period of time and must be moved speedily.
- Here's how this food packer broke a receiving bottleneck and speeded the delivery of tomatoes to the processing rigs.
- The investment is paying off in low operating costs.

Faced about two years ago with receiving and unloading problems of its growing volume of incoming tomatoes, the H. J. Heinz Company's main plant in Pittsburgh enlarged and mechanized its unloading and delivery operations of this produce to the processing stations. The installation remedied previous problems of excess handling and eliminated related difficulties of space and man-hours.

While the tomato receiving period is necessarily dependent on the weather, it usually lasts about six weeks—this year, from the third week in August up to and including the first week in October. During this 36-day period 500,000 bushels of whole tomatoes are moved from

trailer trucks to two processing stations: one on the first floor, the other on the second floor of the same building. (Additional loads arriving by freight car to another receiving point are not concerned in this operation.)

Design for Growth

Prior to August of 1943, one 3-truck dock was available at the east end of the building for unloading purposes. Tomatoes, which arrived in 35-lb. baskets by trailer truck, were unloaded on 4-wheel hand trucks for transfer to a feed-on conveyor. The latter delivered the loaded baskets to the processing rigs (or stations) on the first and second floors.

Due largely to the company's increased volume, the size of the unloading dock and handling methods were no longer considered adequate for the tonnage to be moved. The thousands of baskets to be handled necessarily crowded the dock area, which in turn conflicted with normal outgoing shipping operations. The unloading of the tomatoes tied up outgoing shipment trailers, and as a result shipping had to be done at night during the receiving period. Also, it was difficult to store the empty baskets on the unloading dock.

Following a survey by the company's engineering department, a new and comprehensive plan was designed for bringing the tomatoes to the processing rigs both from the west as well as the east end of the building. Across the street from the west end of the plant a large yard was available which would be ideally suited for an unloading dock. Overhead chain-trolley conveyors of considerable capacity were decided on—one at each end of the

building—for transporting the tomatoes to the processing stations.

Under the new arrangement, the conveyor from the old dock (at the east end) would serve the second-

As the trailers are unloaded, the baskets are transferred to the carrier trays moving by on the conveyor. The overflow during exceptional rush periods can be stored temporarily on the dock area.

The larger chain-trolley conveyor (also known as monorail chain conveyor), is equipped with 800 carrier trays which were especially designed by the company's engi-



Breaks the Bottleneck

floor rig, the conveyor from the new dock the one on the first floor.

The installations were made one at a time over a period of two years, beginning in 1943. The smaller of the two conveyors, measuring 770 ft., was installed first at the east end. Since the conveyor at the west end would carry the baskets across the street, permission for its construction had to be obtained from the city council. The requirement was that the installation must clear the crown of the

neering department to carry baskets of tomatoes. Equipped with variable speeds, the conveyors are capable of a maximum speed of 100 ft. per minute. At this speed each conveyor will deliver 50 baskets per minute to the point of use. However, the system is normally operated at 85 ft. per minute.

The loaded baskets are taken off

the carrier trays and emptied on the preliminary assorting conveyor sections of the processing rigs. The empty baskets are sent back on the return line to the unloading dock.

MEASURING UP TO PRESENT NEEDS

Today a trailer truck is unloaded in minimum time. In view of the hundreds of trailers that are unloaded during the concentrated receiving period, the time factor represents an important saving. Additional man-hours for other essential purposes were also saved through the elimination of the extra handling formerly required in unloading on hand trucks and moving the loaded baskets for transfer to the feed-on conveyor. And because of the greater capacity of the additional unloading dock area, the

(Continued on page 63)



Figure 2—General view of new unloading dock, looped by conveyor, that was built at west end of building.

Figure 3—New dock also has ample space for empty baskets, which are reloaded into empty trucks for return to fields.



street by 22 ft. This was met by having the conveyor enter the building on the third-floor level. When installed, it measured 1,600 lineal feet.

The new dock constructed was 35'x135'. As shown in Figure 2, its whole outer edge is looped by the closed circuit of this larger conveyor. While the photos shown are of this larger installation at the west end, the operational details apply equally to the smaller "east" conveyor.

LOWER DISTRIBUTION COSTS

...and ACME UNIT-LOAD STRAPPING

The flow of materials in and out of your plant . . . from the raw material stage all the way to the customer's door . . . represents an important factor in the cost of distribution. Efficient handling methods can point the way to lowering this cost factor.

When products or containers are steel strapped on pallets or skids to form large units . . . that's efficient materials handling. Warehouse space and manpower are conserved. Loading and unloading is expedited. Product protection is multiplied. *Distribution costs are lowered.*

Acme Unit-Load Strapping will go to work for peacetime industry to provide the same economies that contributed to the flow of the unlimited variety of war materiel and supplies. Acme Steel Company, 2814 Archer Ave., Chicago 8, Ill.

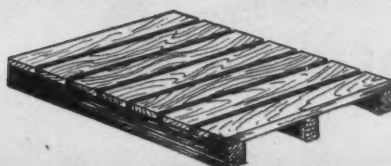
U.S. NAVY
PHOTO

ACME STEEL COMPANY

CHICAGO 8, ILLINOIS, 2814 ARCHER AVENUE

ACME STEEL CO.
CHICAGO

ON THE



PALLET

NEWS · VIEWS · TRENDS

ELECTRONICS will play a great part in future production controls. The latest entry into the control field employing electronics is a feed regulator which controls grinder operations in hammer mills, attrition mills and cutters, maintaining the load of pulverizing equipment at the maximum rated capacity of the connected motor.

An underload light signal indicates failure of material to reach the pulverizer due to empty bins or some other mechanical limitation, and overload controls are made available at various points. Production increases from 20% to 35% from each mill have been indicated by some users.

THOMAS Robins, Jr., president of Hewitt Rubber Corporation of Buffalo, N. Y., recently announced that the company has acquired a controlling interest in Robins Conveyors, Inc., of Passaic, N. J. In addition to directing the management of Hewitt since 1936, Mr. Robins has been chairman of Robins Conveyors' executive committee for the past five years, and there has been a close association between the two companies.

The companies also announce a new office in the United Carbon Building in Charleston, W. Va.

R. U. Jackson will be in charge of the office, assisted by H. N. Kepler, sales engineer formerly in the Robins Washington office.

Handling Hewitt sales will be Nelson J. Reinhold, who has recently joined the company after 14 years with Cincinnati Rubber Co.

THERE is a very definite need for elevators, reciprocating lifts, continuous lifts and dumb-waiters in both manufacturing and storage buildings. When taking all factors into consideration, including land values, a multi-story building will prove more efficient for manufacturing many products and even in warehousing. Where the railroad siding might be on a different level from the truck dock, a two-story building would be required. Naturally, a single-story plant offers greater economy for large, bulky products, particularly when large quantities of metal are consumed. This applies to proposed plants or warehouses.

While there will be plenty of moving into multi-story buildings, considerable alterations will be required. One of the greatest faults with multi-story buildings erected even since the last war is the low capacity of elevators, inadequate elevator facilities and poor location of elevators for efficient mechanized operations. All of these factors naturally greatly affect modern material handling practices.

GLUED Loads—The Quartermaster Corps was among the leaders in the development of stable methods of palletizing. Many subsistence items must undergo extremely rough treatment, such as shifting in car humping, the handling by ship's slings in stowing and general warehouse roughing, and falls, which made imperative the study of the best methods. The average gross weight of palletized loads of subsistence items is about 2,100 lbs., and thus the impact of a fall of only a few inches was a factor of very considerable importance.

Cartons making up a load tended to shift and the load disintegrated, which meant that the entire load had to be reorganized and strapped. After considerable study the problem was attacked from the standpoint of the prevention of side slipping of the individual cartons that made up the load. Adhesive glue was applied to the four corners of each carton, gluing it to the carton above or below it. Then the load was strapped only one way with three straps.

A special adhesive was developed which had sufficient strength to prevent slide slipping when the load was dropped on the unstrapped edge, but was not strong enough to prevent the easy separation of the load. The tensile strength was so low that the separation did not cause tearing to the extent that the cartons were unfit for re-use.

The elimination of three crosswise straps for the usual pallet load developed a saving of 51 ft. of $\frac{3}{4}$ in. by .023 steel strapping and the elimination of two wooden corner protectors. The possibility of cheaper cartons, because of the stability of the glued load, was raised. It developed, too, that 64 man-hours were saved by using such unitized loads directly from the manufacturers' assembly lines through the Quartermaster Depots and to the consumption points overseas.

The reduction of loading time was reflected both in safety from enemy action and the speeding up of turn around time for ships. The development has possibilities for every manufacturer now handling cartons to distribution points and to warehouses.

THE National Battery Company has recently purchased approximately eight acres of land located near the intersection of Lexington Avenue and Hewitt Street in Saint Paul. The land adjoins the Great Northern R.R. tracks, thereby assuring adequate shipping facilities, as announced by A. H. Daggett, President.

The National Battery Company plans to put up a new modern building on this property as soon as construction costs are reasonably back to normal.

HOW YOU PROFIT BY



Pre-Engineering

- Here's a *factory-built* conveyor system that will fit your *custom-built* plant completely!

No special engineering. No delay for estimates on cost. No weeks of waiting for factory fabrication. Barber-Greene Conveyors are pre-engineered—pre-fabricated!

B-G Conveyors are built in a variety of sizes, forms and capacities, to meet any material handling requirement . . . can be installed anywhere.

Erection costs? Your own workmen can install a B-G Conveyor system quickly, easily. Units arrive on the job conveniently marked. Factory assembled terminals and standardized units simplify and speed erection.

Barber-Greene Conveyors are *standardized*. You can make additions and alterations rapidly . . . move it to a new location with 100% salvage. Factory assembly assures correct alignment in erection—reduces belt wear and maintenance expense. Write for Catalog 76. Barber-Greene Company, Aurora, Illinois.

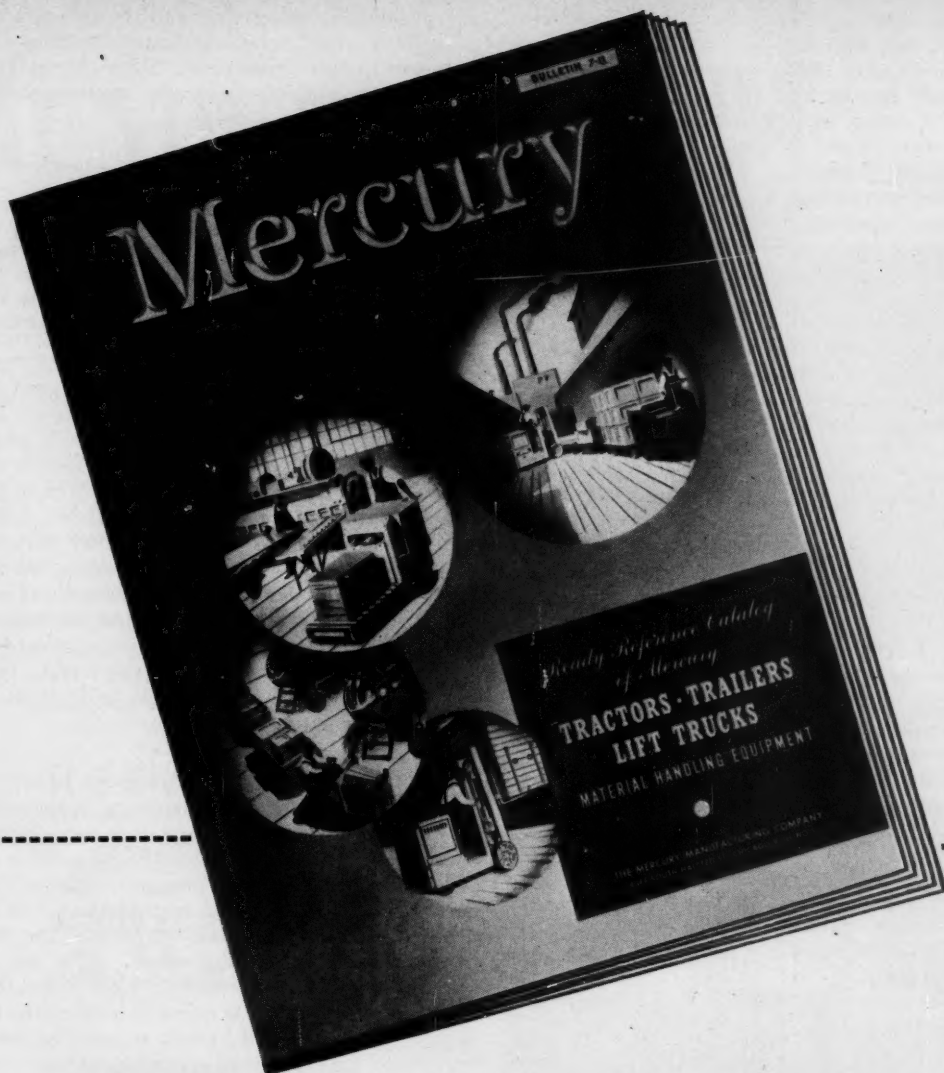


Barber-Greene



Constant Flow Equipment





FREE

REVISED AND EXPANDED EDITION

Valuable Information to Help You Reduce Operating Costs Through Improved Materials Handling

If you are confronted with the problem of handling an increased volume of materials quickly—yet with reduced manpower—you will find valuable help in this new Mercury catalog. Printed in four colors and profusely illustrated, the book thoroughly explains the handling advantages possible with modern power handling equipment. For example, the following are a few of the subjects covered...

1. when to use "Tractors and Trailers" ... "Platform Trucks" ... "Fork Trucks" ... "The Fork Truck 'Trackless Train' System."

2. the "Do's and Don'ts" of Industrial Truck operation.

3. an enlarged reference section on "accessories"—pallets, skids, trailers, charging equipment, toe-plates, etc.

4. a bibliographical source material on materials handling with power trucks.

5. many other brief helpful facts to aid you in planning your handling system.

Write for Your Free Copy Today!

In requesting your copy, please write on your company letterhead. (Revised edition available within 60 days—Get your order in early!)

THE MERCURY MANUFACTURING COMPANY

4154 SOUTH HALSTED STREET CHICAGO 9, ILLINOIS



MERCURY

35 Years Experience in Manufacturing and Installing
'FLOOR MOUNTED MATERIAL MANIPULATORS'
Tractors, Trailers, Hand Trucks, Lift Platform Trucks, Fork Trucks

OCTOBER, 1945

MUCH attention is being directed to the problem of having all handling possible performed by indirect labor handlers so that the direct labor operator only has to feed his machine and remove the part if it cannot be removed mechanically. Indirect labor costs should be segregated so that a thorough knowledge of handling costs is revealed.

It has been proven that the output of machines has been increased upwards of 50% by having porters or handlers relieve the operators of all the distracting, time-consuming handling operations.

CANCELLATION of military orders, it is expected, will reduce backlogs appreciably by the end of 1945. According to the W.P.B., the manufacturers in these fields at present have backlogs ranging from four to seven months of production, but cutbacks have been immediately reflected in urgent civilian items. Industrial trucks are in pretty much the same position at the present writing.

RELIANCE Electric & Engineering Company announces the appointment of two new distributors for Reliance motors, generators, and motor drives.

Standard Electric Motor Works of Detroit will supplement the activity of the company's district office in that city.

In Milwaukee, the C & G Sales and Engineering Company will extend the service of Reliance's Central Western Sales District.

FROM the Bayonne Naval Supply Depot comes a new filing system designed to eliminate the back-breaking job of pulling and pushing heavy file drawers—a system that moves the filing clerks on a track and makes drawers unnecessary. Invented by the Depot's Executive Officer Capt. Hunter and now manufactured commercially, the new system also eliminates stooping and stretching, and has speeded filing operations considerably.

It consists of two parallel filing troughs mounted on legs which raise the top of the file approximately 28 in. from the floor. Between the two troughs runs a track on which a platform with work desk and chair is arranged. The platform runs on a patented device, a ball bearing rolling on a knife-edge double track. The platform is equipped with a brake.

The operator sits at the desk with her work before her and propels herself along by grasping wooden tabs which protrude at 3-ft. intervals from alternate sides of the troughs. With one pull it is possible to slide smoothly from one filing position to another along the entire track length, either backward or forward.

The use of this system has enabled fewer clerks to



do considerably more filing; and the ease of operation is credited with having eliminated the Depot's great turnover in this department. Since the clerks working with the system are always in plain view, maximum work control is provided.

A user of a power belt conveyor located in a very humid climate has considerable difficulty in retaining proper adjustment to insure satisfactory operation for a reasonable time. Excessive breakage of the belt also occurs. What is the most practical solution to this problem?

THE can and the bottle were designed for the consumer. The case was designed for the retailer, and for lack of a more economical unit, and methods to handle it, had to serve the wholesaler and the manufacturer too. But for these handlers of goods in large quantities, we now have the unitized pallet load and the machines to handle it swiftly and cheaply. Many service men and women coming back know how to handle the efficient fork truck. The chain stores, carriers, warehousemen, and wholesalers will not be slow to seize this opportunity to reduce costs and speed handling time when the returns from the required investment in lift trucks and pallets are appraised.—*Domestic Commerce.*

A WIRE rope manufacturer uses a handy method for removing small-diameter wire coils from barrels which are stored on a rack. Since practically every barrel contains wire of a different size, selection cannot be made from either end of the rack. When stock is to be used in production, the head is removed from a particular barrel and the coils are taken out through the opening. They are put on wooden pins which are mounted on pedestals. This avoids removing a whole barrel at a time, which would entail moving a lot of barrels in order to get at the right one. Empty barrels are collapsed before removal from the rack and full ones are then put into storage by means of a portable elevator.

HERE is how time is saved by one company in selecting pallets of the proper size and type. A simple color code is used for this purpose. To make the markings visible from all four corners, the colors are painted on diagonally opposite corners. While yellow might identify a regular 48" x 48" pallet, a combination of yellow and black might be used for four-way entry pallets of the same size. In this way all pallets are properly identified, permitting ready selection without loss of time.

MUCH happened to the 7th Division on Attu—heavy casualties, wounds, sore feet. . . .

Men carried ammunition from the beaches to the guns because wheeled vehicles could not operate in the bottomless tundra of the valleys. Later the division learned to "palletize" supplies. Going into battle, it had as much as forty per cent of the things needed ashore already packed aboard sleds on the ships.—*The Saturday Evening Post.*

IF YOU WANT *Action*

Move Your Materials With SHOP MULES

MULE POWER beats man power! These small, sturdy, powerful tractors haul and push *faster* with fewer men. SHOP MULES move material from stock room to and between processing points, or finished product to shipping docks or storage. Equipped with snow plows, they keep yards, R. R. sidings, driveways, walks, and parking lots accessible. Other attachments . . . electric arc welders, winches, rotary sweeper brooms, etc. increase utility. Three wheeled A3 VICTORY SHOP MULE pictured is only 40" wide and turns in 66" radius. . . . Powerful enough to pull a loaded freight car, yet agile as an eel for navigating congested areas.

HEBARD
INTERNATIONAL HARVESTER POWERED



Information, parts and service at all
International Harvester Industrial
Power Distributors. All Hebard
SHOP MULES are International
Harvester Powered.



HEBARD
A 3 VICTORY
SHOP MULE



W. F. HEBARD & CO.
2433 S. State St.
Chicago 16, Ill.

**Mule Power
Sounds Good!**
Send Your Catalog

FIRM
INDIVIDUAL
TITLE
STREET
CITY STATE

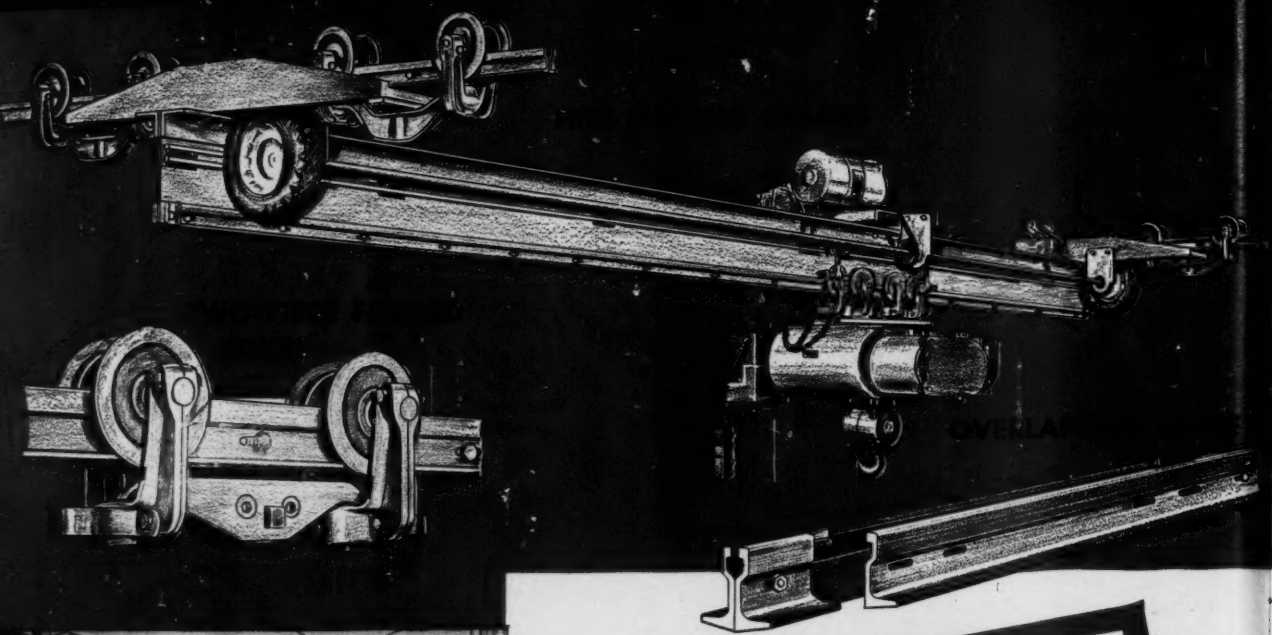
MODELS FOR EVERY SIZE PLANT AND FOR HEAVY OR LIGHT HAULING OR PUSHING

HEBARD SHOP MULES are made in several models to meet the wide range of work in both large and small factories, foundries, steel mills, warehouses, railroads, aircraft plants, airlines, etc. 27 years of experience in solving material movement problems! Write for complete Hebard SHOP MULE catalog and assistance on your problem.

←----- MAIL COUPON TODAY! -----→

W. F. HEBARD & CO. • 2433 S. STATE ST. • CHICAGO 16, ILL.

OCTOBER, 1945



Where
AMERICAN MONORAIL
Pays!

GREATER PLANT CAPACITY

- Permits compact arrangement.
- Converts ceiling to profitable use.
- Overcomes congested conditions.
- Reduces storage around machines.
- Increases warehouse capacity.

FASTER PRODUCTION PACE

- Systematizes flow of material.
- Provides process in motion.
- Decreases idle machine time.

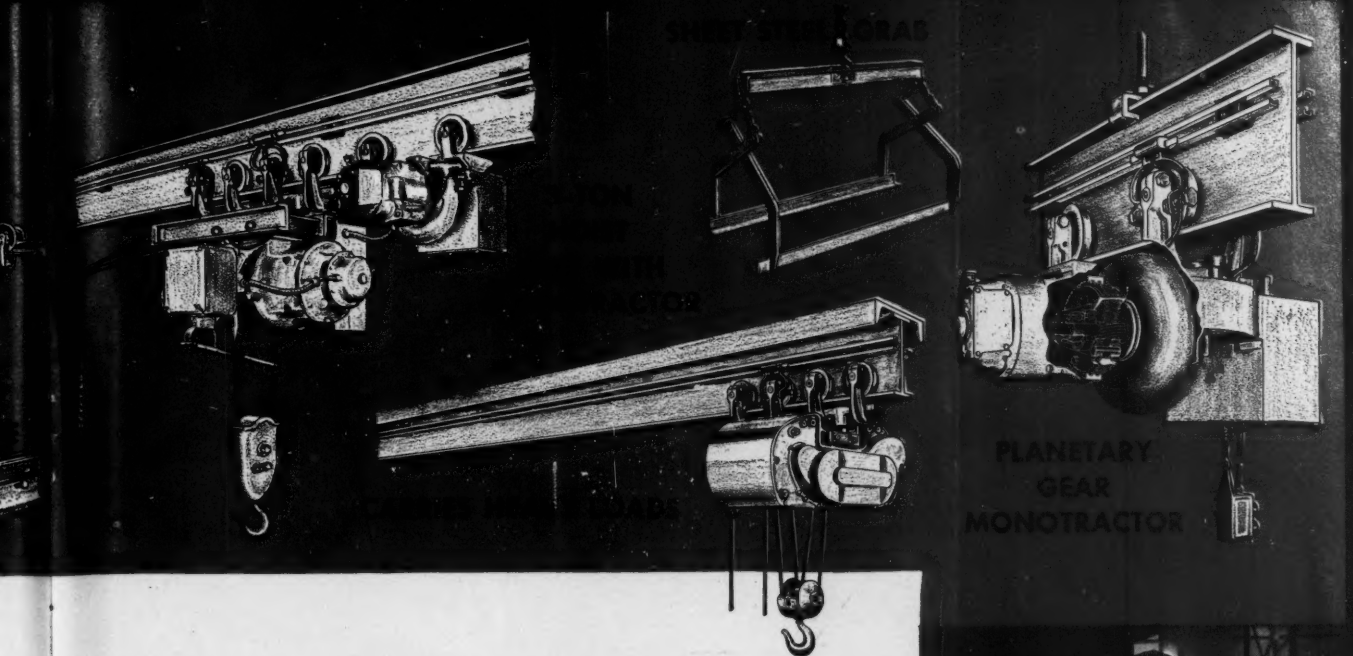
CONSERVES SKILLED LABOR

- Eliminates handling fatigue.
- Reduces accidents with heavy loads.
- Requires no full-time operator.
- Permits work at convenient height.

REDUCES DAMAGE AND LOSS

- Ends floor deterioration.
- Assures safe handling of product.
- Reduces damage in motion.

13129 ATHENS AVENUE



AMERICAN MONORAIL ENGINEERS *can show you how*

FROM their specialized experience in solving overhead handling problems in every industry, American MonoRail engineers can suggest simple methods for improving operations in your plant.

Their recommendations often show increased production from skilled help by merely eliminating the lifting and carrying labor of handling jobs.

Such suggestions, when made early in the planning of industrial projects, often save valuable time and material. They have been requested and welcomed by nationally known architects and engineers.

We therefore place the complete facilities of our engineering staff at the disposal of any company planning to build or expand.



Overhead track system speeds up handling of material and assures accurate, safe moving.

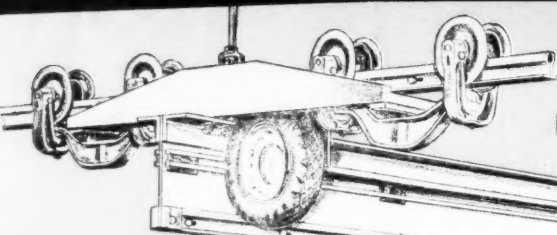


Flat products move fast with precision with the overhead track system.

SEND FOR BULLETIN C-1,
a 56 page book showing
successful applications of
American Mono-Rail
systems.

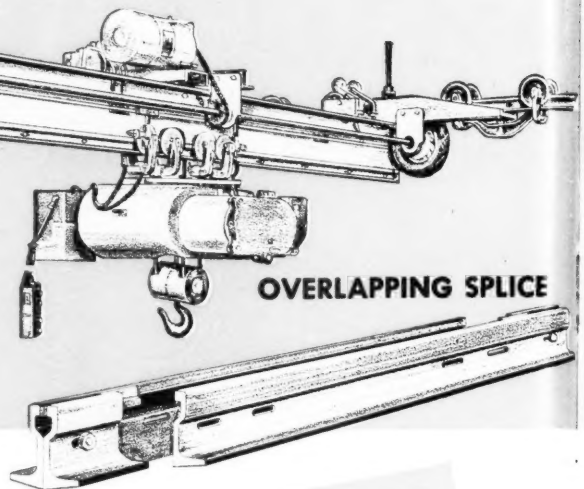
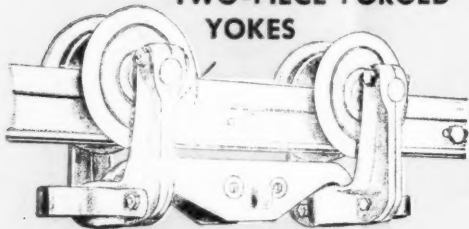


CLEVELAND, OHIO

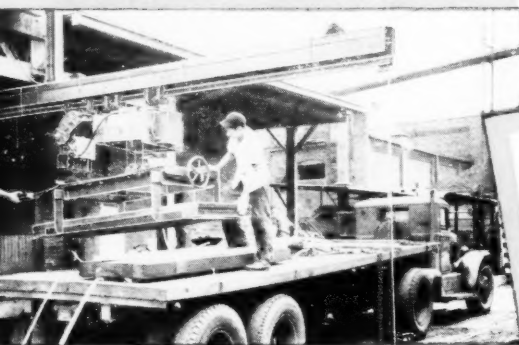


FREE MOVING CRANES

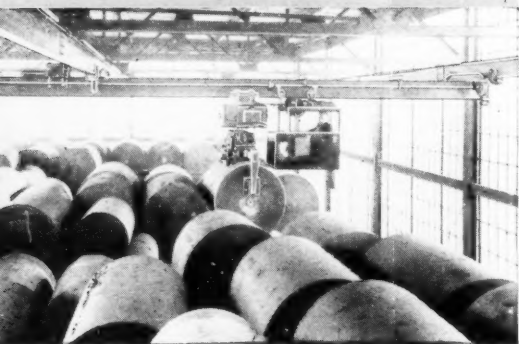
TWO-PIECE FORGED YOKES



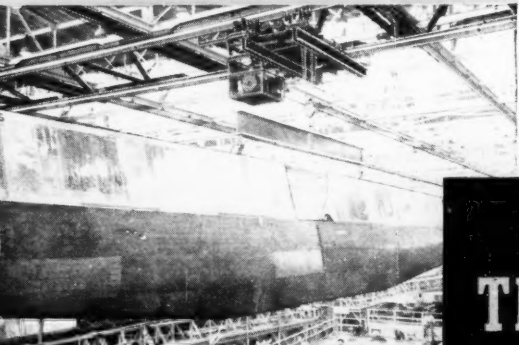
OVERLAPPING SPLICE



Simple jib crane with interlocking system in warehouse saves \$20 per truck unloading cost.



Motorized cranes on multiple runways allow maximum use of storage space in paper warehouse.



10-ton twin-bridge crane handles huge center section of B-29 wing with motor controls in cab.

Where **AMERICAN MONORAIL** *Pays!*

GREATER PLANT CAPACITY

- Permits compact arrangement.
- Converts ceiling to profitable use.
- Overcomes congested conditions.
- Reduces storage around machines.
- Increases warehouse capacity.

FASTER PRODUCTION PACE

- Systematizes flow of material.
- Provides process in motion.
- Decreases idle machine time.

CONSERVES SKILLED LABOR

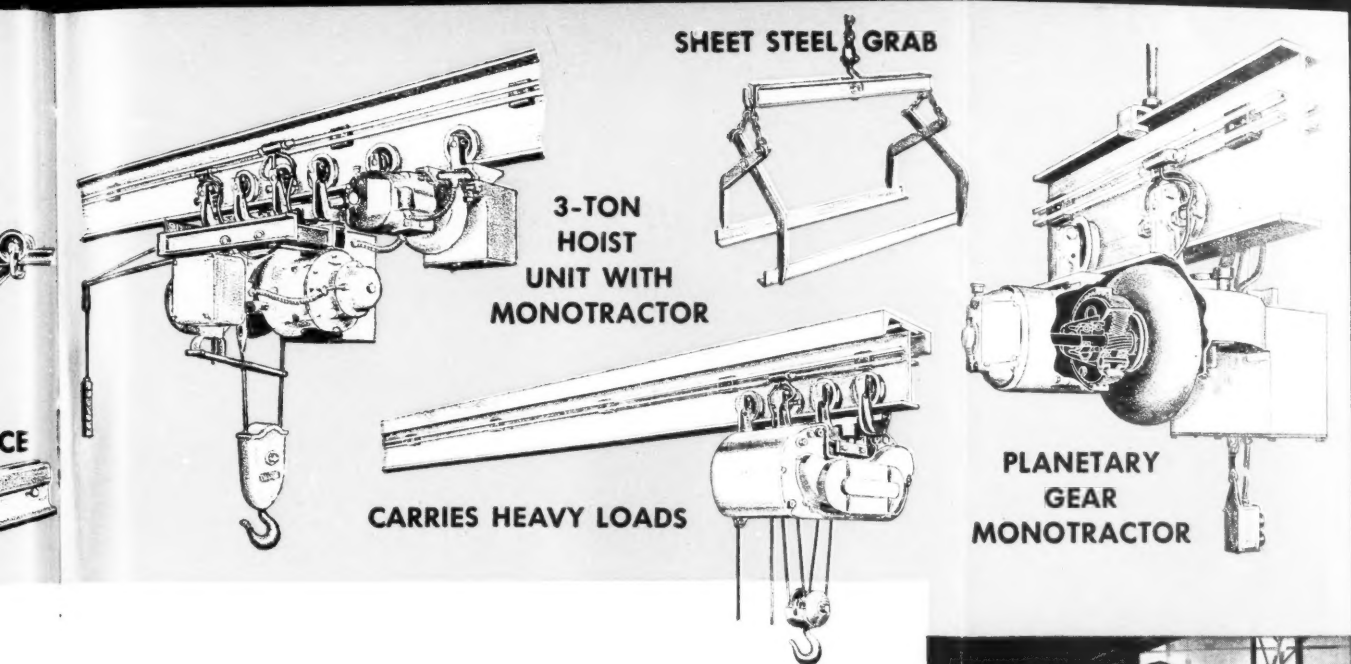
- Eliminates handling fatigue.
- Reduces accidents with heavy loads.
- Requires no full-time operator.
- Permits work at convenient height.

REDUCES DAMAGE AND LOSS

- Ends floor deterioration.
- Assures safe handling of product.
- Reduces damage in motion.

The **AMERICAN M**

13129 ATHENS AVENUE



AMERICAN MONORAIL ENGINEERS

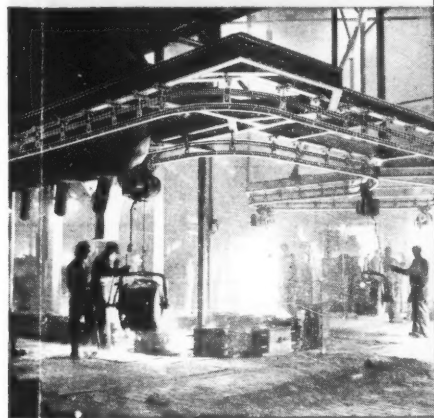
can show you how

FROM their specialized experience in solving overhead handling problems in every industry, American MonoRail engineers can suggest simple methods for improving operations in your plant.

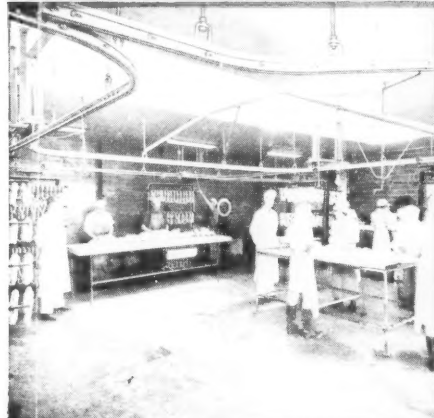
Their recommendations often show increased production from skilled help by merely eliminating the lifting and carrying labor of handling jobs.

Such suggestions, when made early in the planning of industrial projects, often save valuable time and material. They have been requested and welcomed by nationally known architects and engineers.

We therefore place the complete facilities of our engineering staff at the disposal of any company planning to build or expand.



Electrified track system speeds up handling of hot metal and assures accurate, safe pouring.



Food products move between processes with little rehandling from original racks.

AMERICAN MONORAIL Co.

CLEVELAND, OHIO

SEND FOR BULLETIN C-1,
a 56 page book showing
successful applications of
American Mono-Rail
systems.



THE
th
m
terial
gan to
nary a
small p
dled wi
work st
after a
framew
and th
came a
transpo
assembl
ing the
getting
welding
tions re
from tw
creased
to be m
transfer
on an
necessar
the wor
than the
it was c
dling of
vided. T
below w
lem:

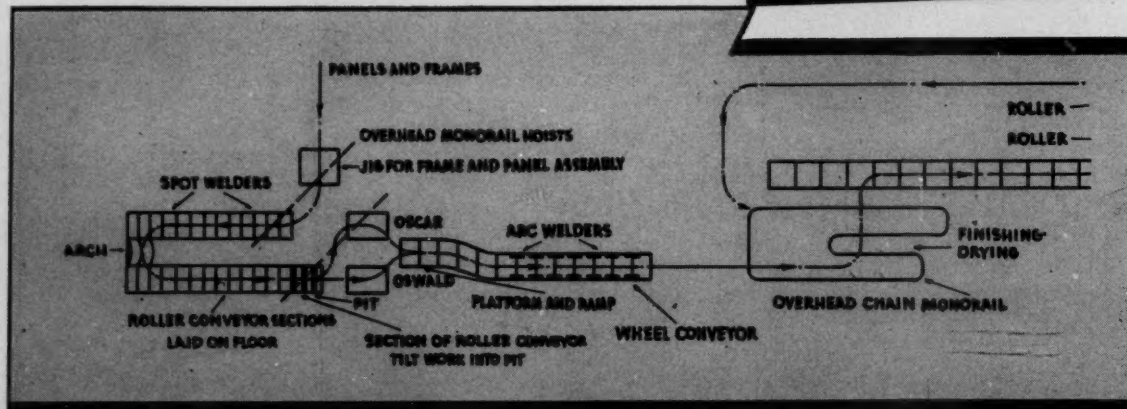
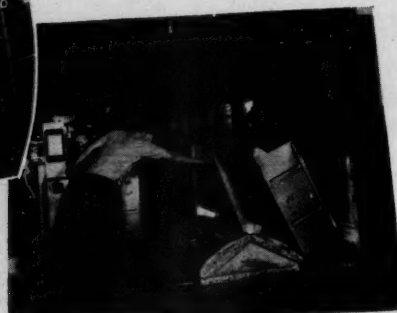
Wel
To se
framewo

IF YOU ARE HANDLING HEAVY PIECES

ONE of the contributions to American Army landing operations was the development of what was called a "jeep trailer." As finally used, this water-tight jeep trailer had to be able to float, fully loaded, in the sea. Navy demands eventually developed which required a production of 4,000 of these trailers per week, and new and faster production was, of course, essential. This description deals with the American Central Manufacturing Company operations at the Connersville, Indiana, plant. Mechanization was paramount, man-hours had to be reduced. Mechanical handling equipment made the job possible. One man can position the pieces which would normally take two to four men to handle.



Fig. 1—An overhead hoist sets this frame on an assembly, and then the assembly to the conveyor as shown in Figure 2.
Fig. 2—Set on the floor, "U" shaped line was arranged as to permit two parallel rows of spot welding operations on the pieces.
Fig. 3—Closeup of the "hump" at the top, left.
Fig. 4—Closeup of the "hump" at the turn-around of the "U" shaped line. Note guardrail to prevent work from falling over.



Here is a production line that was developed for one specific heavy product. Over one hundred and fifty thousand were made during 2½ years by The American Central Manufacturing Corporation, Connersville, Indiana. The lessons learned can be applied in many plants.

... Easy Does It

Handling Large and Heavy Pieces the Problem

THE flow of work in process in the jeep trailer line was not much of a problem in material handling until the body began to take shape. The preliminary assembly operations were of small pieces which could be handled with ease on hand trucks from work station to work station. But, after assembly of the supporting framework, the assembly of panels and the finishing operations became a troublesome problem in the transportation of a large and bulky assembly, weighing 190 lbs. Moving these assemblies around and getting them into position for spot welding and arc welding operations required their handling by from two to four men each. If increased production demands were to be met, some better method of transfer from operation to operation and of pre-positioning was necessary. It was necessary to take the work to the worker, rather than the worker to the work—and it was essential that ease of handling of these heavy pieces be provided. The flow diagram sketched below was the answer to the problem:

Welding Panel Assembly

To set the framework in the framework and the panel jig, an



Fig. 4—A pit and tilting section of roller conveyor with a guardrail is at the end of the spot welding line. The body is tipped over and then carried by monorail to the holding and transfer jigs—"Oscar" and "Oswald." Each jig has two arms for holding the trailer assembly. They are mounted on upright posts and can swing horizontally 200 degrees. The arms can transfer the body to the ramp in Fig. 5 or can turn the work around completely and hold it in a vertical position for welding the four inside corners.



Fig. 5—Swung by "Oscar" or "Oswald" to a ramp, one man can tip the body over and position the work for arc welding operations.

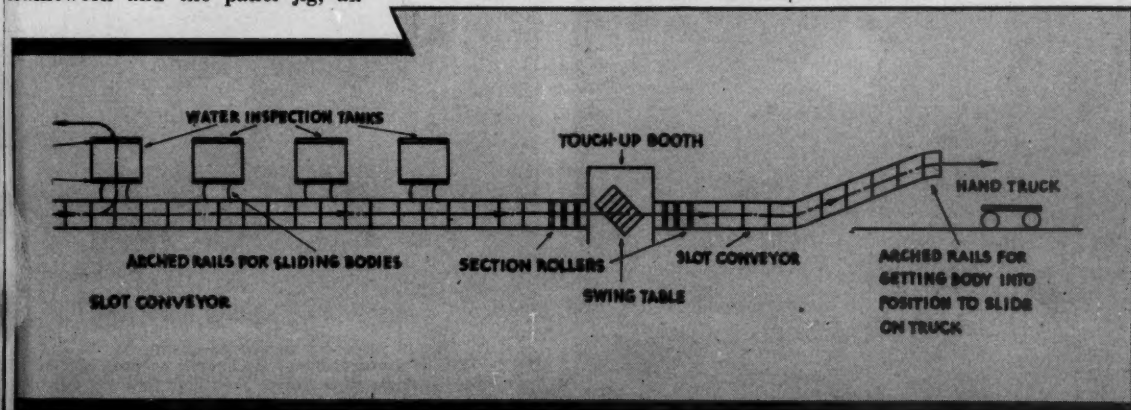


Fig. 6—An overhead chain conveyor carries the work through the cleansing, spraying and drying operations. Work is positioned for efficient handling by personnel.

over head monorail hoist was installed. (Figure 1.) This overhead monorail hoist, after panel and framework assembly, carried the assembly to some sections of roller conveyor set on the floor, where it was placed on end to be shoved along under the spot weld machines. (Figure 2.)

About six inches above the floor a guard rail ran the length of the conveyor section to prevent the work from tipping. Welding the bottom flange on the side shown up required two spot weld "rows". The welding machines are so positioned that the arm of one extends a trifle farther out over the line of flow than the other.

The flow of work through the four spot welding machines is a "U" shape line (Figure 3). After the first two spot welding operations, the assembly is pushed over an arch, which tips the assembly with the opposite side up onto other sections of the roller conveyor, and the work flows back along the conveyor through two more spot welding operations. A higher guard rail, some three feet off the floor, is alongside the second section of the conveyor opposite the arch or "hump," to prevent the work from falling over.

At the end of the spot welding



line the trailer body is pushed along on the roller conveyor until it enters a section above a pit in the floor. (Figure 4.) This section of roller conveyor has a fence or rail guard at the end to hold the body as it is tipped into the pit, end up. Above the pit is an electric hoist on a monorail which takes the work to "Oscar and Oswald." These are the two jigs observed in Figure 5 that position the work again for a down welding operation. Until the construction of this jig, two tables were in use and four men were necessary to handle and position the assembly. Now "Os-

car" takes the place of one man and "Oswald" of another. Both have radial arms, as can be seen in the accompanying photo, and the work can be swung by either of the jigs to the platform at the edge of the ramp shown. Work can also be rotated for welding all four inside corners.

The use of the ramp with its "hump" permits one man to tip the body over so that it continues on its flow through three arc welding booths bottom-up. The inclined ramp feeds the body onto a wheel conveyor set in angle irons the exact width of the trailer and the work is pushed along on the

Fig. 7—A slot conveyor carries the assemblies to the inspection stations. They are slid along the rails, are handled by one man.

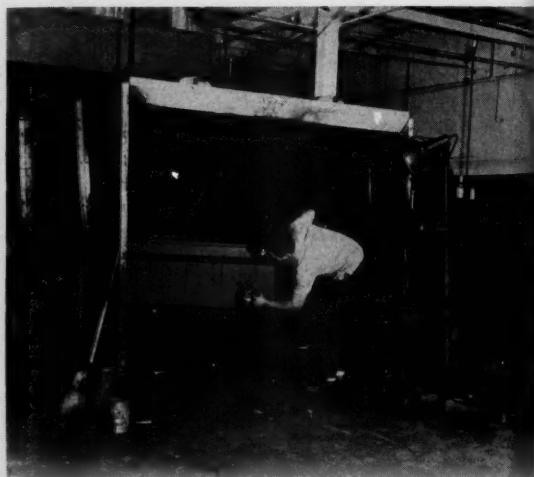


Fig. 8—The slot conveyor brings the body to sections of roller conveyors on which pieces are given their final finishing operations. They are taken from here again by slot conveyors up an incline.

wheel conveyor a few feet off the floor and at the proper height, and bottom-up for the three arc welding operations.

Finishing Operations

After the arc welding operations, the work is transferred with ease by means of a hand truck from the wheel conveyor to an overhead monorail conveyor, which was installed to carry the work through the cleansing, spraying, and drying operations. This overhead monorail conveyor circled through two spraying booths where a prime coat was applied to one side and then to the other side of the body. The overhead monorail conveyor carried the trailer just a few feet off the floor and at the proper height for spraying (Figure 6).

As the assemblies were carried from the drying ovens by the continuous overhead monorail conveyor, a slot conveyor was conveniently nearby so the assemblies could be transferred to the slot conveyor for transfer to the inspection stations. (See photo.) This slot conveyor was only about two feet above floor level and, as the assemblies approached the battery of inspection tanks, two bent pipes or rail skids were in position for sliding the body off the slot conveyor and up to the water tanks for testing. A roller at either end of the tank aided in sliding work in and out of the tank. The buoyancy of the water permitted one man to inspect and to remove the trailer to a hand truck. (Figure 7.)

The hand truck brought the work back for hanging it again on the overhead chain monorail for final finishing. The bodies were hung on this overhead monorail, spaced eight feet apart, and there was always a space between the bodies coming from the oven for the first time to hang a tested assembly for final finish. After final finish and drying the assembly was again taken off the overhead monorail as it left the oven and placed on the slot conveyor, which carried it through the touch-up booth on the way to the shipping platform (Figure 8).

Touch Up: Shipping

Here the assembly was swung around on the roller conveyor table and given a final touch-up. It was

Cut Your Load-Handling Costs with this versatile always-on-the-spot **ROUSTABOUT CRANE**



The speedy doer of a hundred jobs around your plant

Roustabout saves you time
and money on these and
many other jobs

Big stuff off and on
trucks, freight cars

Moving large
machines

Handling bales,
boxes, drums

Moving big castings,
motors, railroad and
marine gear

Loading air transport
planes

Handling tanks,
pipe, structural steel

Installing heavy
valves and fittings

"Our Roustabout Crane is the last piece of equipment we'd want to give up. It's busy all the time." That's what one owner says of his Roustabout, and hundreds more say the same thing. For outside the range of your other material handlers this powerful crane, always where you want it when you want it, moves, loads, stacks heavy stuff to 7½ tons quickly, at low cost, meeting emergencies, saving manpower. Designed and built for smooth easy operation and years of overwork, Roustabout's boom swings on a heavy ball-bearing turntable, its gears run in oil. . . . It pays you to write now for the whole story of this crane.



THE HUGHES-KEENAN COMPANY
648 Newman Street, Mansfield, Ohio

Roustabout Cranes

By Hughes-Keenan

then pushed through an opening in the booth where another slot conveyor carried it up an incline to the



Fig. 9—The exit of the incline on the floor of a shipping platform. Work is so positioned with pipe arrangements as to slide with ease on trucks.

floor of the shipping platform. To position the work so that a hand truck could be slid under it with ease, two more pieces of bent pipe received the work from the slot conveyor and elevated it to the proper height (Figure 9).

YOU CAN BRING THE TOOLS TO THE WORK



FLOW can be made a matter of bringing the tool to the work as well as carrying the material to the tool. This special purpose jib crane drill, homemade by Reliance Electric & Engineering (Cleveland, O.) engineers, is hung on structural building members, and covers a 12 ft. radius to reach heavy pieces which are inconvenient to handle.

See page 49 for a description of the articles Flow will present in November.

The Care of Wire Rope

Wire rope conservation is a problem in a great group of industries who are large users of material handling equipment. The experience of three users of wire rope should aid you in stretching YOUR cable.

STARTING with a series of suggestions from dealers and manufacturers, rope consumers during the war years solved operational problems with new methods which effectively conserve cable. Hundreds of rope users have developed and passed on to others worthwhile methods of maintaining and operating steel cable which extend its life. Several helpful suggestions on specific conservation methods are contained in this article. Each user had a peculiar rope problem to solve, and that is why other users of wire rope will find these solutions practical and beneficial.

Round-the-Clock Operation

An independent producer of iron ore in northern Minnesota uses large quantities of wire rope on power shovels, draglines, hoists, and at two underground properties, in slusher operations. His problem was to keep his cable working round the clock under the strain and stress of high-speed heavy work.

The user had previously tried several types of wire rope on each of the operations, keeping an accurate record of the servicing, breaks, and replacements for each type. Having determined the type of wire rope which was best suited to his needs, this user set about to extend the working life of the cable by a program of on-the-spot conservation. After observations in the field and examinations of carefully maintained records, he found that in each of the four operations where steel cable was used, there was one or more measure of preventive maintenance which he could take.

Hoists. At regular intervals, the cable is removed from the hoist

drums, a foot or two is cut from each end, and the drums rewound. This changes the location of points where the cable rides up to form



"Each time the machine is idle during the day it is checked from boom sheave to treads. Wire rope is run through slowly and examined."

a new layer of turns on the drum, lengthening the life of the rope by more evenly distributing wear.

Power Shovels. Cables are turned end for end at regular intervals. This accomplishes the same result as removing a foot or two from each end of hoisting cable and rewinding.

Draglines and Shovels. One of the principal problems in dragline and shovel operation is presented by the grit and abrasives which ride the rope back into the sheaves and drums. Lubrication at scheduled intervals, following a thorough cleaning of both sheaves and drums as well as the rope, prevents broken or rusted strands of wires and scored and pitted sheaves and drums.

On all operations, this mining concern follows a general pattern of inspection to conserve wire rope. All equipment is examined before new rope is wound, and is inspected at regular intervals thereafter to see that sheaves are aligned, that grooves are not cut or rims broken,

that journals are not worn or damaged, and that drum shafts have not become bent.

Heavy Earth Moving

An earth-moving contractor in the west experienced difficulty in working with scrapers and bulldozers in a light sandy soil. What started as a routine check on maintenance methods on this job developed into an exhaustive examination of a disproportionate number of cable breaks and replacements. This was doubly puzzling to the contractor because he had recently installed preformed-type wire rope on all his equipment in a bid to smoother and more continuous operation.

This contractor discovered that, although the records showed regular servicings and lubrication of the scrapers and bulldozers, there was no record of wire-rope lubrications. When questioned, the maintenance superintendent admitted that a swipe over steel cables with an oily rag usually passed for lubrication. More patient than most men, the

contractor explained that, although all types of wire rope, including preformed, are provided with an inner core lubrication, this wears away with constant operation and so needs to be renewed regularly.



"Cropping off the end of a damaged or worn line extends life of wire rope."

He then issued the following memorandum, addressed to the superintendent and personally repeated to each service man:

"All wire rope on scrapers and dozers must be lubricated not only regularly, but *correctly*. On this project, correct lubrication will consist of the following steps:

"1. The entire length of wire rope will be cleaned thoroughly with kerosene and a wire brush before any lubrication is applied.

"2. A light-bodied lubricant will be applied to the rope with a fairly stiff paint brush, or will be poured from a can into a large swab held about the rope.

"3. Excessive lubricant will be wiped from the rope before it is placed in operation.

"4. This lubrication will be done at regular, stated intervals, and written records will be maintained.

"5. Service men will continue to inspect and clean drums and sheaves as in the past."

Within a month, cable breaks on this project had decreased 70 per cent. The contractor commented:

"In the fields, on operations that are continuous, any wire rope is doomed to failure unless it is lubricated regularly and correctly."

Service in Gravel Pit

A gravel-pit operator in the mid-west was troubled by rope fatigue. As he observed dragline oper-



Make certain the wire rope is properly started on the drum, to avoid nicking and scraping.

PNEUMATIC Would a CONVEYOR SYSTEM

Solve Your Problem?

Pneumatic Conveying is the modern answer to many problems which develop in the handling of fine, dry materials, as a product or as a by-product of a manufacturing process. If you are now working with this kind of material, or plan to do so in the future, and would like to determine the advantages which pneumatic conveying offers you, we will be glad to make available our Testing Laboratory, wherein Capacity, Power Consumption, Breakage through Handling, and Allowable Moisture Content of your material can be analyzed. Our method of pre-testing eliminates guess-work, gives you concrete facts on which to judge the effectiveness of this type of conveying. Write Laboratory Testing Department:

NATIONAL CONVEYORS CO., Inc.
50 Church Street New York 7, N. Y.

Conveyor Specialists—Manufacturers of National Steam Pneumatic Ash Conveyors and National Chipveyors for Metal Turnings.

ations one day, he noticed that the cable vibrated each time the bucket was filled and drawn in. He called his service man and they began an immediate examination of the clutch and brakes of the machine. The brakes were inclined to slip and the clutch chattered. Coupled with the somewhat hurried handling on the part of a rather inexperienced operator, this chattering of the clutch was magnified and telegraphed throughout the length of the rope. Whipping or vibration very quickly causes rope fatigue.

(Continued on page 63)

WAR'S "SECRET WEAPON"

now available to industry

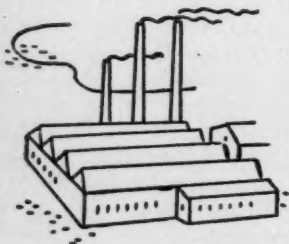
REPRINTED FROM THE
NEW YORK HERALD TRIBUNE
May 6, 1945

... were useless.
The Navy was faced with the acute problem, not only of expediting supplies to the Pacific but getting them there in condition to be used long after their arrival.
The important thing was to get the supplies there—faster. "Palletizing" solved this problem to a great extent. "Palletizing" has cut in half the man-hours of labor necessary to move material from the factories to the wharves, to the ships and to the battle fronts. The pallet upon which the methods of "palletizing" are based is a slotted platform or double-faced skid moved by metal "fingers" on special trucks. The principle in itself is not new, but the adaptation by the Navy in combination with highly improved fork-lift trucks and new techniques has made it possible to deliver speedily record-breaking quantities of material to the war fronts.

*Know how "PALLETIZING"
solved the Navy Department's
gigantic task
of materials handling.*

Now, private industry can avail itself of the ingenious methods perfected by the experts called in by the Navy. In this respect, Pallet Sales Company proudly announces that Curtis H. Barker, Jr. who was with the United States Navy as Technical Adviser of the Field Operations Branch has joined our organization.

Many of America's largest plants are turning to Pallet Sales for an economical and speedy solution to their shipping and distribution problems. Your inquiry is invited. There is no obligation.



PALLET

sales company

122 EAST 42nd STREET, NEW YORK, N. Y.



WHAT EVERY FORK TRUCK OPERATOR SHOULD KNOW

LEARNING the hard way"—throwing a new operator into a job without preliminary instruction is obviously wrong. The operator very often can make or break a fork truck program. As a matter of long-range planning, every man who is to act as an operator should be given an instruction course which is designed to make him properly accredited for the work. If he has a full understanding of his job, it will decrease the man-hours required for loading and storing goods, and will reduce damage and repairs both to materials handled and equipment and will, in general, develop better warehousing and safer handling in the plant.

Establishing a program of training is not very difficult. It requires a truck and a properly set up area in which the man or woman practices the job. A hard-surfaced area is necessary (a secluded corner is desirable). If the course is to be given to a number of prospective operators, the class should not exceed five or six, since a larger class is unwieldy and the necessary personal touch is lacking.

The first problem is to make the prospective operator familiar with the feel of the truck—what it will do and not do—and he should be given instructions on the type of materials he probably will handle in his work. The instructor should point out the design of the fork truck, emphasizing the fact that it is necessarily slow; also that sudden stops and starts, or fast, sharp turns often will cause loads to upset, damaging either or both the equipment and the material being transported. There is a calculable risk to the operator in such a pos-

sibility also, which might make this particular phase of the instructions more personal.

Since fork trucks carry the load ahead of the front wheels, it would be best to tell the neophyte that the center line of the front axle is the fulcrum for the load. The truck tends to nose over, and it should be pointed out that this is the reason for rating trucks in terms of pounds load and distance to the center of the load. If a truck is rated at 4,000 lbs. at 15" and, if the load were 2,000 lbs., the distance to the load center could be doubled. Therefore, this same truck could be rated at 2,000 lbs. at 30". The trainee will quickly understand the problem of shifting of center of the weight. The machine cannot think for itself—the operator must do this.

The instructor should demonstrate to the entire class and/or each individual how to make the machine move in both forward and reverse. Steering is done with the left hand only. The reason for this is that there are separate controls for lifting, tilting, change of direction and speed. Since all of these are operated by the right hand, it is obviously impossible to steer with the right hand, or both hands, and still operate the lifting controls efficiently. The primary problem is to keep control of all operations of the truck at all times and, therefore, the right hand must re-

main free. It would be best to emphasize this several times, because it is a cardinal point in the instruction of trainees in this work.

The student then should drive the truck himself. He should try straight lines backward and forward, make circles, figure 8's, and turn sharp corners. After he has familiarized himself with the handling of the machine in such simple maneuvers, the instructor should then set up an "obstacle course." This should consist of boxes or pallets on edge in a straight line with just sufficient space between them to permit the passage of the fork truck, as shown in Figure 1. In traveling through this maze the fork truck zig-zags between each obstacle. Each student should drive his machine through this maze until he is proficient in moving around them with free, easy curves. It is none too early to reiterate here the danger of making any sudden movement. Sudden stops, starts or turns should be fully trained out of the operator from the beginning. All turns are to be made as gradually as possible, since in handling trucks the operator will require *extreme accuracy* in spotting loads in warehousing. Thus high speed is not a primary factor. Sudden turns cause loss of control and destroy the accuracy, while long slow turns permit a better gauging of distance and accuracy in placing of loads with no lost time.

This preliminary instruction will probably take the better part of the morning. As a conclusion to the morning's studies, the instructor should lecture on two points:

1—Safety. The problem of approaching intersections, traveling up and down ramps, recognizing stop signs and safety zones (if they are part of the plant's operations), the use of the horn as a

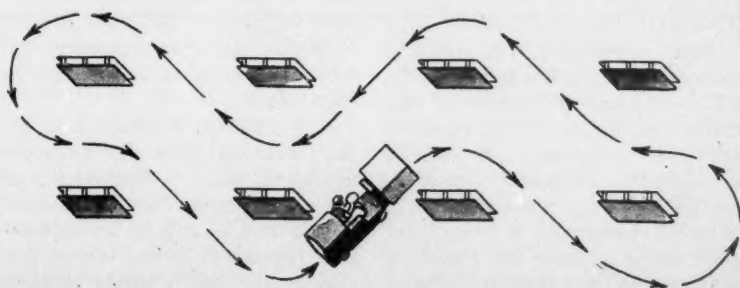
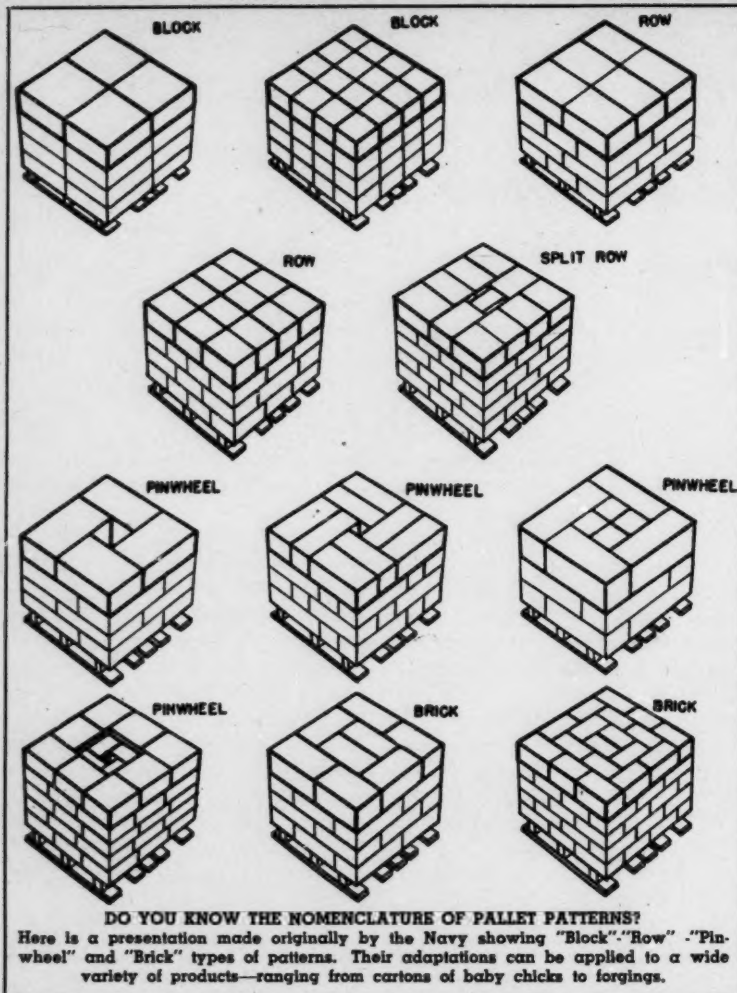


Figure 1. Obstacle course for new truck operator.



safety signal and the use of lights when conditions require them, should all be included. Some discussion of the eccentric loading of the trucks and of eccentric loading of the elevator or means of conveyance should be covered here, too. The necessity of a flag to call attention to a protruding load should be emphasized. And the instructor should insist upon not driving a truck when it is so loaded that vision is obstructed.

Safety shoes should be worn by the operator. Lifting should be done safely—there is a correct way—the application of common sense cannot be taken for granted. Short cuts are to be avoided and traffic lanes established wherever there are pedestrians. If there is a possibility of traffic (truck to truck) accidents, point this out in your own plant now. A truck traveling along an aisle has the right of way and an operator entering

the aisle should wait until he has a clear road. Where main aisles intersect, the vehicle from the right has the right of way. Trucks should not be parked in the aisles or any place where they will present a hazard or interfere with pedestrian or truck travel. Trucks should not be permitted to block emergency exits or equipment.

2—The prospective operator should get a preliminary lesson at this point on his equipment. The operator should be instructed to inform the proper maintenance man when his truck is not in good condition, and the importance of safe steering linkage should be emphasized.

Any man who knows how to operate a car will know that he should not travel with his foot resting on the clutch pedal. This is as bad for a fork truck as it is for an automobile, because it causes loss of tension on the clutch spring allowing

the clutch to slip, resulting in excessive wear. Probably at this point the instructor, as well as the trainee, will be ready for lunch.

If there is any time left, the student should practice the maneuvers shown in Figure 1 for the remainder of the morning.

In the afternoon another obstacle course (with aisles slightly narrower) could be developed as shown in Figure 2. The student will run the fork truck up and down the aisles in both forward and reverse. If two fork trucks are available, they should be used so two operators can learn to pass each other in the aisles. The rest of the day should be taken up with this practicing and general maneuvering. In the meantime the instructor should observe the operators to see if they evidence the intelligence and alertness, the coordination and interest that should be expected of anyone handling equipment which not only represents capital investment but a potential money maker.

It is understood that the above instructions and practice work are to be done when the truck is not loaded. In the next period of instruction, before the operator drives the truck with a load, each student should be introduced to the following operations:

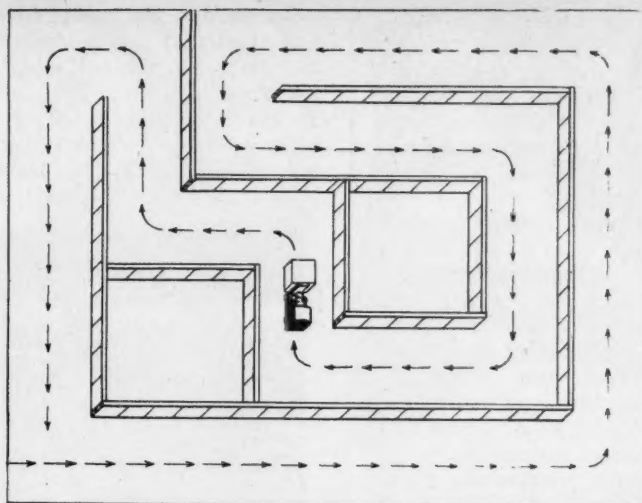
1—How to approach a pallet or load. Aim the forks of the truck so that they can enter between the top and bottom faces of the pallet at an equal distance from the center stringers. Aim the forks so the load is equally distributed on both sides.

2—How to insert forks. The forks of the truck should be inserted into the pallet or load as far as they will go. It is very important that the operator should have the load as close to the heel of the fork as possible for safety.

3—How to lift the pallet and move it away. The operator should be instructed (a) to apply the hoist control to lift the pallet slightly from the floor; (b) to apply the tilt control to tilt the uprights back and (c) then apply the travel control to move the truck backward or forward.

4—Lowering the load. The operator should (a) apply the down control until the load is on the floor and (b) then tilt the uprights to

Figure 2. More advanced obstacle course—the second, practice type.



the vertical position so the forks can be removed easily.

5—How to use the fork truck tilt backward or forward. The backward tilt is used to permit the load to lean against the backrest as a safety measure. This tilt helps to stabilize the load on the machine. The forward tilt can be practiced in the stacking of actual loads to a greater extent than with empty pallets or an imaginary load, but for the first lesson empty pallets should be used or a small load should be put on a piece of 2 x 4, so the operator can learn how to tilt the upright to pick up a load not on his truck level.

This second group of instructions can and should take the first afternoon of the second day. By

the end of the second day the student probably will be familiar with his controls, and familiar enough with his machine so he has confi-

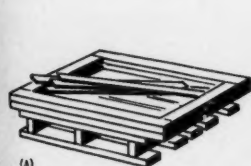
dence in how it will operate. In an early issue the second group of lessons—an advanced course—will be presented.

"PICTURE FRAME" PALLET DUNNAGE

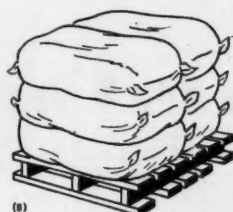
IN ORDER to successfully stow on pallets certain materials which will not support the

ing, corrugated nailing, or lap joining. The upright sections are made 48" in length; the horizontal sections 60" in length; the cross pieces, or diagonal supports are made from

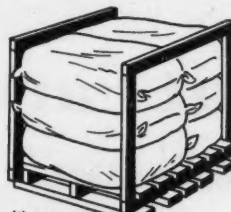
from the edge of the pallet. The cross braces are nailed on with one or two light nails. The material is then stored with the fork truck. In breaking out, the material is



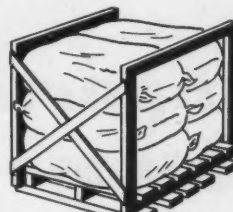
(A)



(B)



(C)



(D)

Steps in assembling a "Picture Frame" pallet.

weight of additional material on top of it, the "Picture Frame" method of vertical dunnage was developed. This performs the function of a rack or box type pallet, yet it is easily dismantled to provide a piece of equipment which consumes minimum storage space when not in use.

The "Picture Frames" are constructed from 2 x 4 sections assembled on edge, either by toenail-

5/8" thick and 4" wide dunnage wood.

In operation the "Picture Frames" are stacked flat on a pallet with the diagonal braces heaped in the center. These are transported to the car door by a fork truck. When the pallet loads are made up the "Picture Frames" are fitted between the top and bottom decks of the pallet through the lip formed by the inside of the runners

carried to the freight car or truck and the cross pieces are pulled off by hand, the frames removed and the material stowed into the car or truck. The frames and cross pieces are then piled on the pallet as before.

This technique was developed by the Navy for storage of shovels, brooms and life belts; it obviously has many applications in handling many awkward civilian items.

A 1-MAN CREW

A NOVEL and economical use for a lift truck has been devised by Joseph Howard, Chief Engineer for Boott Mills, Lowell, Massachusetts. Howard has equipped a lift truck with a scoop attachment and uses the unit as a one-man maintenance crew.

Such jobs as moving coal to the boilers, hauling ashes from boiler pits to trucks, moving and stacking barrels of oil and even carrying wet concrete from mixer to forms keep the lift truck busy 24 hours a day. Prior to the installation of the lift truck, Howard had three men on each of three shifts to handle this work; now a crew of three men han-

dles all the work during a complete 24-hour work day.

In receiving and shipping operations, 50 gallon drums of oil are carried to storage on the scoop, drums being stacked two deep in storage to conserve space. In hauling coal to the boilers, the scoop carries a 600-lb. load on each trip, lifting the load to a height of seven

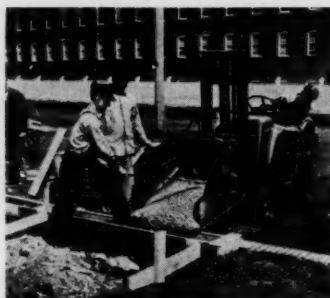
DID you know that by removing a vital part of a gravity roller conveyor, the installation can perform an additional function, improving the entire operation?

Cartons of soap were delivered from a sealing machine on a conveyor bed with the cartons in a vertical position, and were top-heavy when allowed to move down a sloping chute. By removing one of the rollers from the sloping conveyor section, the cartons automatically turned over to a position with a lower center of gravity and thereafter negotiated the chute smoothly.

feet. The average trip on this operation is 500 feet, requires 5 minutes. Between 300 to 600 tons of coal are handled each month in this fashion.

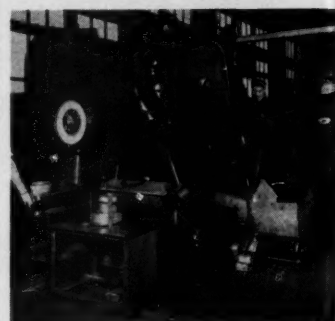
In removing ashes from the boiler pit, a scoop attachment travels 1,000 feet on each trip, part of which is up a steep ramp. The

scoop empties the ashes directly into a truck at a height of seven feet. 30 to 60 tons of ashes are hauled each month. The cement hauling job was just one of the many odd jobs to which the lift truck is assigned and, as Howard states: "I don't know what we'd



Carrying wet concrete from mixer to forms is just one of the many tasks performed by this lift truck at Boot Mills, Lowell, Mass. The scoop attachment serves also for handling coal from bunker to boilers, removing ashes from boiler pits and for numerous other maintenance jobs. The Boot Mills maintenance staff has been reduced from nine to three men since the adoption of this modern handling system.

do without this machine now that we're accustomed to using it on all these jobs." In use for several



STACKING COMPONENTS

Considerable time is saved in the storing and stacking of electric motor lamination components by this automatic conveyor device, added to a standard punch press by Reliance Electric & Engineering Co. of Cleveland. Finished standard laminations come down the main conveyor to stack on the table in the foreground, which has an automatic jogging compartment to align these notched pieces. The center section of the lamination is separated and stacked for future use in preparing similar components for smaller frame size motors.

years, the equipment has paid for itself and improved maintenance efficiency throughout the plant.—
Courtesy Towmotor Corporation.

Important Facts to Consider...

When You Buy a Mobile Crane

Until 15 years ago, only one type of Mobile Crane was available—an industrial tow tractor with a boom mounted on the front end and a winch on the rear end. When the load was lifted, steering became difficult, and traction was lost; swing of the boom and travel with the load were unsafe, if not impossible.

Then came KRANE KAR... a complete Mobile Crane of original design providing front-wheel drive, power swing boom, and stability without stabilizing devices.

With the advent of the War, the demand for cranes stimulated the manufacture of mobile cranes similar to the KRANE KAR. These models are outwardly similar, but are they "just as good?"

HOW CAN THE PROSPECTIVE CRANE BUYER JUDGE? To the right are listed the salient features of KRANE KAR. These features are based on a LIFETIME of Automotive Crane construction—on experience gained by building thousands of KRANE KARS for industry, railroads, public utilities, municipalities. The buyer should demand ALL these features. Without all of them, no Mobile Crane provides the efficiency, safety of operation, and economy afforded by the famous KRANE KAR.



THE ORIGINAL SWING BOOM MOBILE CRANE
WITH FRONT-WHEEL DRIVE AND REAR-WHEEL STEER

2½, 3, AND 10 TON CAPACITIES

KRANE KAR

SILENT HOIST & CRANE CO., 888 63rd ST., BKLYN 20, N.Y.

Hoist line, boom topping and boom swinging, and travel are independently or simultaneously operable.

Positive control: automatic braking of load and boom lines... no slipping clutches or brakes to adjust.

Independent full capacity power winch for boom topping increases efficiency, flexibility, and safety of operation.

Front-wheel drive: 100% traction—light or loaded.

No tail-swing and no part of crane passes over operator.

All crane and travel controls centralized for convenient handling by driver from his seat.



Write for
Catalog
No. 58

Automatic power cut-off at all extreme positions of boom.

Self-stabilizing: no stabilizers when swinging loads to sides.

Four travel speeds. 2-speed gearing for all crane operations.

Rear-wheel steer: affords shortest possible turning radius, greatest stability.

Vision unobstructed—of the roadway and the load, right down to the ground.

Hoisting, lowering, automatic braking and holding controlled by one lever.



OCCASIONALLY it is necessary to place fork trucks in freight cars where no car level platforms are available. Figure 1 shows how it can be done.



Figure 1



Figure 2

Figure 2 shows the simple, safe ramp used for the operation.

MOVING CONVEYORS



Figure 1: Simple dolly embodying hold down clamp. Note the ingenious canopy provided to protect the operator from the sun. Addition of flaps with windows could be developed for reasonable protection from the elements.

QUITE frequently it is desirable to move portable inclined conveyors (which are mounted on small wheels and casters) fairly long distances between

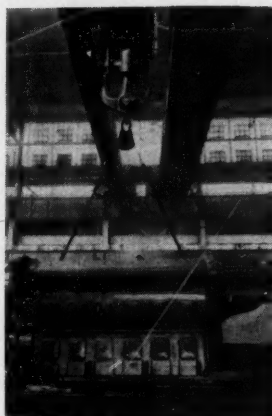


Figure 2

places. Following a Navy Employees' Suggestion Program idea, the development of a dolly for this purpose is of interest.

Figure 1 shows a simple dolly with 10-inch wheels, embodying a hold down clamp, being hauled by a gas powered tractor. Figure 2 shows the tractor hauling the conveyor which has been securely fastened to the special dolly.

A 14-TON AUTOMATIC-EQUALIZING CHAIN SLING permits level carrying



of an unbalanced 13 ton Diesel motor at C. B. & Q. railroad repair shop, Burlington, Iowa.

ICING REFRIGERATOR CARS

THERE seems to be no standardization of methods used for placing ice in refrigerator cars. The methods employed now range all the way from the use of the old block and fall to the employment

Plug 'em
into any
socket—

THESE **HUSKY**
ELECTRICAL
UNITS

Fast, clean, easy to use, these well engineered conveyors handle practically any type bulk material—save time, save money. Each model is available in four sizes: 8 and 12 inch widths, 13 and 20 foot lengths.

CON-VAY-IT



For moving ashes, cinders, grain, seed, sand, gravel, metal parts, aggregate, brick, clay, sawdust, chemicals, coal... all sizes.

FLIGHT-VEYOR



For lifts too steep for a belt. Raises material up to 9 feet with the 13-foot model and up to 14 feet with the 20-foot size.

Distributors in principal cities of the United States and Canada

AMERICAN CONVEYOR COMPANY

1107 W. Adams Street Chicago 7, Illinois
Please send bulletins on CON-VAY-IT and FLIGHT-VEYOR.

Name
Address
City & State



This Army Ordnance Depot uses G-E automatic chargers to speed handling of ammunition for our armed forces.

AUTOMATIC CHARGING OF ELECTRIC TRUCK BATTERIES PAYS BIG DIVIDENDS



G-E Automatic Copper-oxide Battery Chargers are designed to meet the exacting charging requirements of large industrial electric truck batteries as well as the smaller requirements of batteries used in motorized hand trucks. Located in central charging stations or in truck working areas these trouble-free chargers offer astounding savings in POWER . . . TIME . . . LABOR.

HERE'S WHY

COMPLETELY AUTOMATIC—The truck operator merely sets a simple control and the charger "takes over." It delivers the charge then shuts itself off.

LOW INITIAL COST—Initial cost is low and quickly amortized by reduced power bills, maintenance and labor costs.

REDUCED POWER COST—G-E Copper-oxide Chargers operate at 70 per cent efficiency at full load, only slightly less at one-half load.

NEGLIGIBLE MAINTENANCE—The only moving part is the fan which needs lubrication once a year. Removal of dust from the cop-

per-oxide stacks is the only other maintenance required.

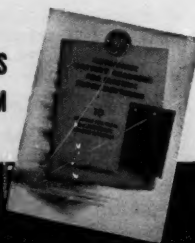
HIGHLY FLEXIBLE—No costly special foundation, base or other installation equipment is needed. Chargers can be easily moved from place to place.

OCCUPY LITTLE SPACE—The G-E automatic charger occupies approximately three square feet of floor space and can be fitted into convenient unused spots.

NOON-HOUR BOOST—Installed in truck working areas the charger will give a "noon-hour" boost to batteries.

For further information, write to Section A1054-136, Appliance and Merchandise Department, General Electric Co., Bridgeport, Conn. Ask for the new truck charger bulletin—Publication No. 52-46.

**BUY WAR BONDS
AND KEEP THEM**



GENERAL ELECTRIC

of modern equipment designed for the purpose.

Here at least is one type you may have never seen before that

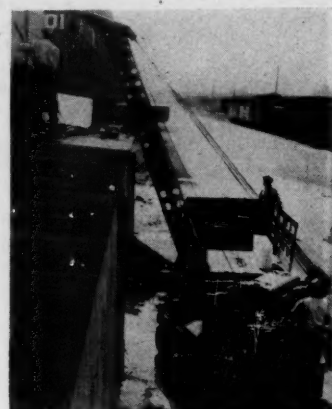


Figure 1

might give you an idea for your plant. In Figure 1 is shown the crane operation which was super-

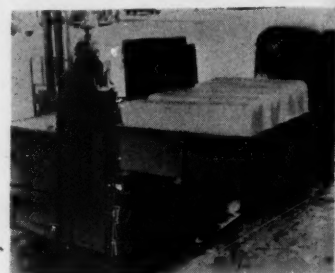


Figure 2

seded and discontinued in favor of the fork truck equipped with (Figure 2) a metal box pallet with tail-

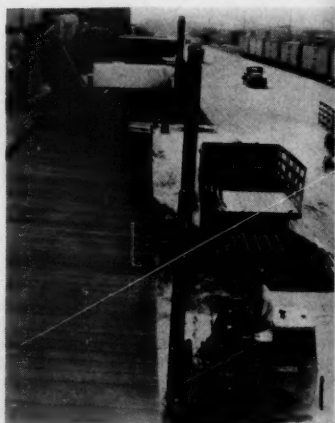


Figure 3

gate. Figure 3 is posed at exactly the same location as the superseded method in Figure 1.

ed for
e you
e that



Here are the things you must do to keep your conveyor and conveyor belts operating. Keep your belt clean. Be sure to remove spillage that may otherwise get around to the pulleys. Keep the belt running true. Keep it running centrally on the idlers at all times. Keep the idlers lubricated so that both carrying and return idlers are free. Inspect one idler so that you can always tell whether the idlers in general need lubricating. Protect the belt at the loading point. Do not let heavy loads come onto the belt suddenly. Feed the loads as gently as possible. Watch your belt lacings. Inspect the lacing daily, or trouble will result. Be sure that your belt is not too loose or too tight.

★ ★ ★ ★ ★

SAFETY HINTS

Truck operators should sound horns or warning gongs at all blind intersections.

—○—

To prevent eye injuries, the Navy requires workers to wear goggles while applying or removing steel strapping.

—○—

Persons should not be allowed to stand under loads suspended from fork trucks, cranes or hoists.

—○—

All protruding nails in packing cases and pallets should be withdrawn or driven flush with the wood.

—○—

The practice of cutting corners should be discouraged. It may result in upset loads, damaged goods, and serious injury.

—○—

Never tow freight cars with a fork truck. The car may suddenly tow the truck instead.

—○—

To prevent accidents in loading, have operators check the security of bridge plates frequently.

—○—

Never permit unauthorized persons to operate fork trucks.

—○—

Riding on the forks of trucks can lead to serious injury. This practice should be prohibited at all times.

★ ★ ★ ★ ★

exactly
versed

LOW OCTOBER, 1945

24 PAGES pictorially presented, showing CLARK Fork Trucks and pallet methods in 32 different types of materials handling operations.

Contains illustrations and specifications of different pallet designs.

Yours for the asking—mail the coupon NOW!

CLARK TRUCTRATOR DIVISION
4401 JAMES STREET, BATTLE CREEK, MICHIGAN

Name.....
Company.....
Address.....
City.....Zone.....State.....

DOES Floating Storage SOLVE Your PROBLEM ?

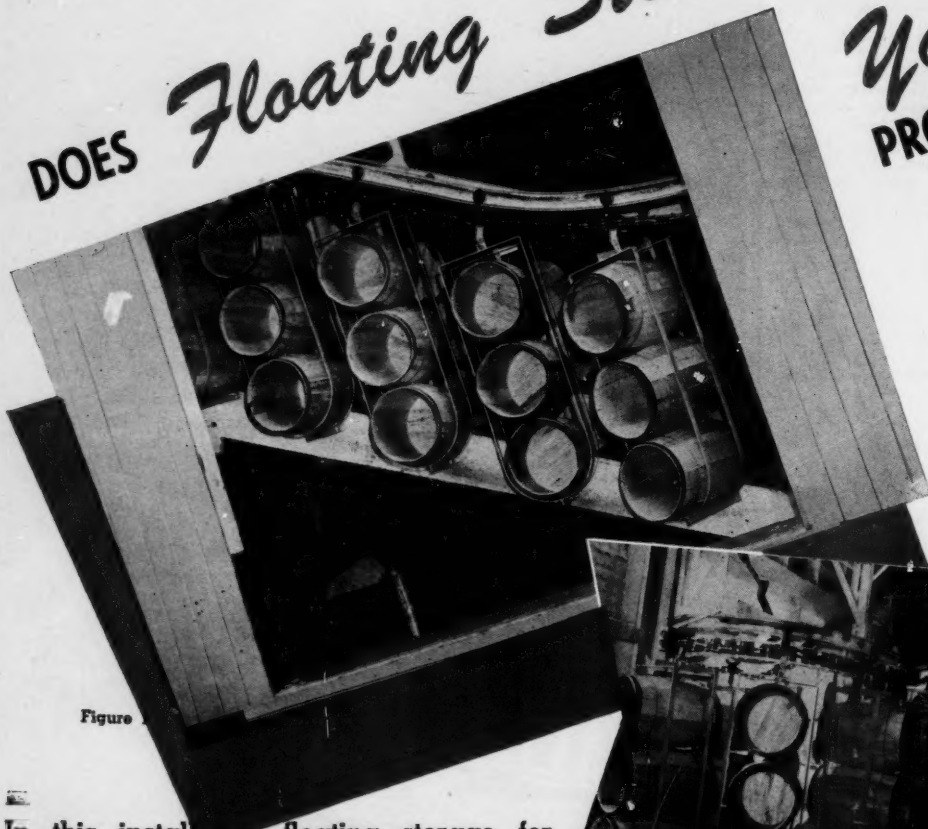


Figure 1

In this installation floating storage for empty kegs was provided, eliminating handling and storage problems, facilitating packing of nuts and bolts.

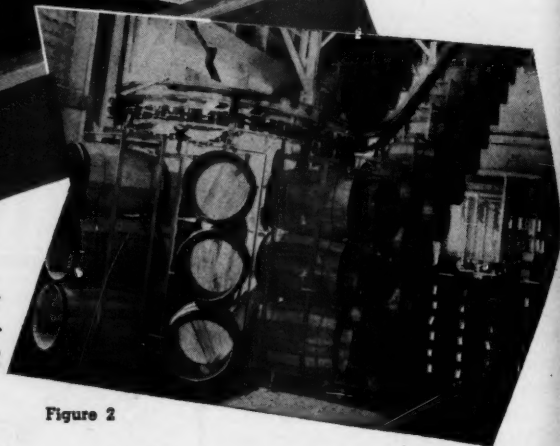


Figure 2

THE problem in this case was caused by a shortage of storage space in the receiving room and by excess handling of empty 12-inch kegs. These had to be sent in small quantities from temporary storage on the ground floor to the second story packing station numerous times throughout the day.

A standard overhead chain type conveyor was subsequently installed on which 550 empty kegs were floated in temporary storage. The installation not only relieved the congestion in the receiving room and eliminated excess handling, but also facilitated the packing operation.

The Problem

The Lamson and Sessions Company manufactures bolts, nuts and hundreds of other metal fasteners for which approximately 550 kegs are used daily for packing purposes.



The kegs arrived by truck, were unloaded, and put into temporary storage in the receiving room, which was usually crowded. When the packing department on the second floor (located in a nearby building) asked for more kegs, 30 to 40 were sent up on a cleated belt conveyor. Upstairs, the kegs had to be carried some 35 feet to the point of use. More could not be sent at one time because of lack of floor space. Thus, the supply of kegs to the packing station involved a continual handling operation.

Effectiveness of Remedy

The overhead chain type conveyor was installed in May of this

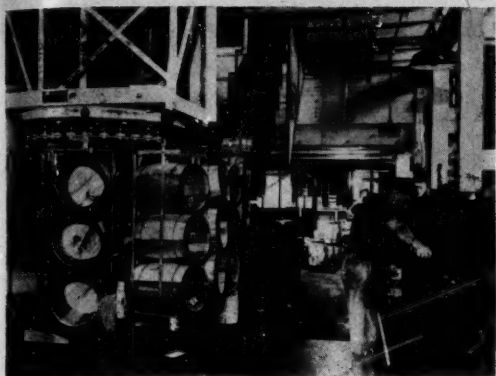


Figure 3—The packing station. Delivery and return lines can be worked either simultaneously or alternately.

year. It takes the kegs to the second-floor packing station, providing the operator with a constant supply. Because the conveyor's capacity of 550 kegs is sufficient for a full day's run, the handling operation has been reduced to an absolute minimum. The following comparative summary shows how it was reduced.

BEFORE—Number of Handling Operations

- 1—Off delivery truck and piled into storage space.
- 2—Carry out of storage and load on conveyor.
- 3—Take off on second floor.
- 4—Carry to packing station (about 35 feet).

AFTER—Number of Handling Operations

- 1—Load from delivery truck onto conveyor.
- 2—Take off by packer on second floor as needed.

Another advantage is that the bolt and nut packer can now remain at his work station without interruption. The empty kegs float by within his reach. Since he no longer is required to go after kegs, increased productive effort at the work station has resulted. Another gain is the time saved previously required for sending up the kegs from the ground floor receiving room.

Details of Operation

In order to load the conveyor with minimum handling, a doorway was cut in the receiving room wall at a point near the drive end of the installation (Figure 1). Suspended from the conveyor chain at intervals of two feet are

specially designed crate type carriers, each 45" deep and accommodating three kegs placed horizontally. The service truck backs up to the open door and the driver loads the kegs directly onto the conveyor, three kegs to a carrier.

The conveyor inclines through the ceiling of the one story receiving room, crosses a balcony to the adjacent building where it dips down to a convenient height for



Figure 4

the packer (Figure 2). The overall length of the looped installation is 300 feet. While it has variable speeds, it is usually operated at 11 feet per minute.

Since a packing station is located at both the left and right sides of the conveyor, the delivery and return lines can be worked (Figure 3) either simultaneously or alternately. A third station could be installed. If more packing stations should be required in the future, a simple extension of the installation would meet this need.

The nuts and bolts come to the packer in tote boxes on a gravity

roller conveyor. The contents are tipped into a funnel-shaped hopper under which the kegs are placed. The full kegs move by spiral gravity chute to the ground floor store room.

Note on Carrier

The crate type carriers (Figure 4) which carry the kegs are a novel feature of the installation. The design was developed by Plant Engineer Roy Stevenson in cooperation with the conveyor engineer making the installation.

Keep 'em Rolling

If a truck breaks down on the job, do not permit the driver to repair it and do not attempt to have another truck push it to the shop until a competent mechanic decides what must be done. Too often, pushing a truck results in permanent damage. Truck speeds have been found to be best at about 4 miles an hour, loaded.

Treat your inside trucks just as you do your long-distance haulage trucks. Check regularly, lubricate regularly. Keep systematic lubrication and mechanical check charts. Get a lubrication chart from the manufacturer of your truck for proper lubricating points. Proper lubrication, regularly done, will save your equipment.

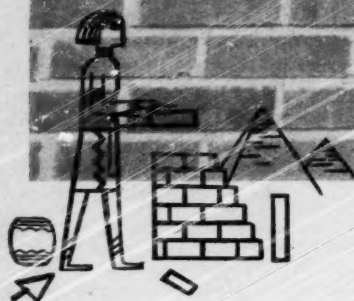
1945		NOVEMBER						1945
Sun	Mon	Tues	Wed	Thurs	Fri	Sat		
				1	2	3		
4	5	6	7	8	9	10		
11	12	13	14	15	16	17		
18	19	20	21	22	23	24		
25	26	27	28	29	30			

NEXT MONTH

How a paper board company modernized its material handling program. It was prepared to handle a greatly increased flow of goods with ease when "postwar expansion" orders suddenly poured in after V-J Day. . . . A place for everything and everything in its place when 19,000 different parts are moved to the assembly line; handling and control operations in the stockroom of a well-known turret lathe manufacturer. . . . The proper handling of heavy, yet delicate pieces in a precision grinding operation represented a serious problem. Not only was it solved by means of the proper devices, but the new method also set the pace of production; and spoilage was practically eliminated. . . . It's important news when a manufacturer increases the capacity of his packing department over 300 per cent and at the same time cuts former packing costs by 50 per cent, which was the result of mechanizing. . . . How many operations are eliminated when a company converts from manual handling (of packaged products) to the palletized unit load system? Don't miss this illustrated discussion in FLOW for November. . . . These are just some of the editorial highlights in next month's issue.

"Oldest Industry"

New Ideas



FEW people outside the ceramics industry realize the high degree to which mechanized handling equipment may be integrated in the operations of a modern brick factory. An example is the Ohio Clay Company. With a factory staff of 40 operators producing 4,000 tons of brick per month, the company manufactures as much or more brick per man as any plant in the country.

Behind this production accomplishment is a completely mechanized handling system which connects all major sequences of

operation. These begin with the blasting of the raw material on the shale deposits located on the factory site and end with the loading of the finished product in freight cars or highway trucks. The sketch of the process flow chart gives a connected picture of the operations.



An Interview
with
**GEORGE W.
DENISON**
President,
Ohio Clay Co.

MOVING THE RAW MATERIAL

The blasted shale is loaded by powered shovel in side dump cars (Figure 1), which are hauled by a gasoline locomotive to the raw

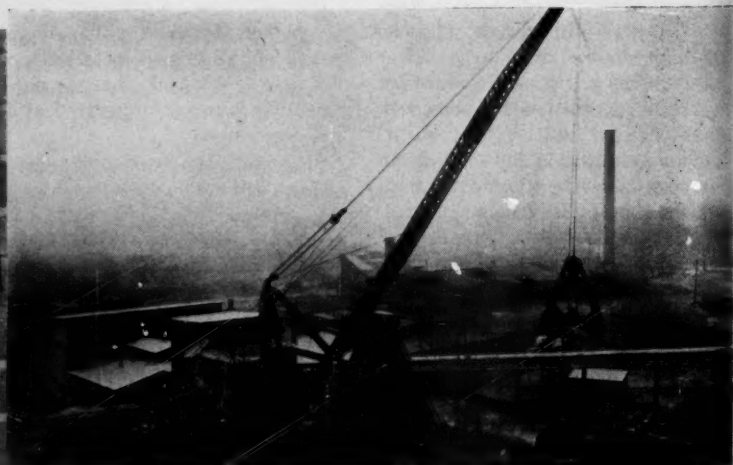
shale storage area. The length of the haul varies from 500 to 1,000 feet, depending on the site of the blasting operation.

Care is taken to provide enough work ahead between certain key operations so that the manufacturing department always has an ample supply of prepared raw material to draw on. Sufficient raw shale is kept in storage to supply the factory for 30 days or more.

A grab bucket, operated with a 120-ft. stiffleg derrick, accomplishes the transfer from the raw storage supply to the primary crusher ("G" and "H" on flow chart). The crushed shale is carried by troughed-belt conveyor to the grinding operation ("I"), where a control lever directs the flow by gravity chute into any one of three dry-pan grinders. Bucket elevators carry the ground shale to the screens, from which the oversize material is returned to the grinders by gravity chute. The finely



Figure 1—View of the raw material storage area, showing the side dump car being loaded by the powered shovel. The locomotive is in the background.



powe
anot
char
Th
for
carri
troug
ton s
ly ov
stora
princ
ing f

H
Th
disk
pug
The
passe
matic
bring
stack
Th
opera
the c
self-lo
with
This
pende
ated l
Aft
drier
butto
the p
loadi
shelf.
each
butto
form
for lo
deck.
positi
secon
turns
front
on the
to the
pleto
The l
vents
again

The
brick
rails o
This t
track
the lo
the dr
truck
design
track
the tru
to the

powdered product is moved by another belt section (top "K" on chart) to a storage hopper.

The powdered shale, now ready for manufacturing purposes, is carried by a 250-ft. overhead troughed-belt conveyor to a 100-ton storage hopper installed directly over the brick machine. The two storage hoppers again illustrate the principle of "work ahead," providing flexibility operations.

Handling in Manufacturing

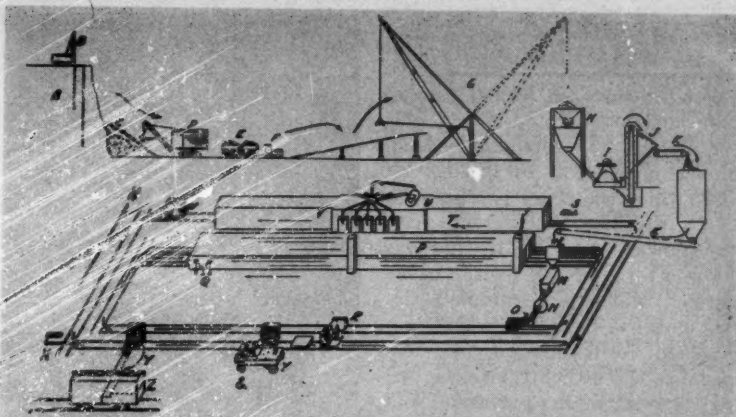
The powdered shale is fed by disk feeder into the combination pug mill and extruder machine. The column of deaerated clay passes under the circular-type automatic cutter, and the delivery brings the green bricks to the stacking operators ("O").

The platform on which these operators are standing is part of the cutter. It is self-elevating and self-lowering, moving up and down with the delivery of the cutter. This part of the machine is suspended on cables, which are operated by a hydraulic ram.

After the bottom deck of the drier truck is loaded, a push on a button elevates the platform from the pit to the second position for loading the rear half of the second shelf. The next steps in the cycle, each controlled by a push on a button, are as follows. The platform rises to the highest position for loading the rear half of the top deck. Next, it lowers to the second position where the front half of the second deck is loaded; then it returns to the top deck where its front half is loaded. The next push on the button returns the platform to the pit. The cycle is now completed and ready for the next car. The loading in this sequence prevents the operators from leaning against the soft product.

A "Belt Line" of Cars

The drier cars with the green brick are run on the transverse rails of a powered transfer truck. This truck operates on a section of track that is at a lower level than the longer tracks passing through the drier. Thus, when the transfer truck arrives with its load at the designated drier door, the drier track is lined up with the rails on the truck, and the car is advanced to the next operation. The trans-



- A. Shale
- B. Electric drill
- C. Shale blasted down
- D. Electric shovel
- E. Dump cars
- F. Gasoline locomotive
- G. Classifying grab bucket and derrick
- H. Primary crusher
- I. Grinding pans
- J. Screens
- K. Conveyors
- L. Storage over brick machine
- M. Brick machine
- N. Brick cutter
- O. Hacking green brick from cutter to drier cars
- P. Drier

- Q. Hydraulic equipment for automatically carrying cars through drier
- R. Transferring dried brick from drier cars to kiln cars
- S. Hydraulic ram for advancing cars through kiln
- T. Car tunnel kiln
- U. Application of powdered coal for burning
- V. Waste heat exit for drier
- W. Exit burned brick on cars
- X. Hydraulic ram for automatically returning kiln cars for unloading and reloading
- Y. Unloading finished brick
- Z. R. R. cars and highway delivery trucks.

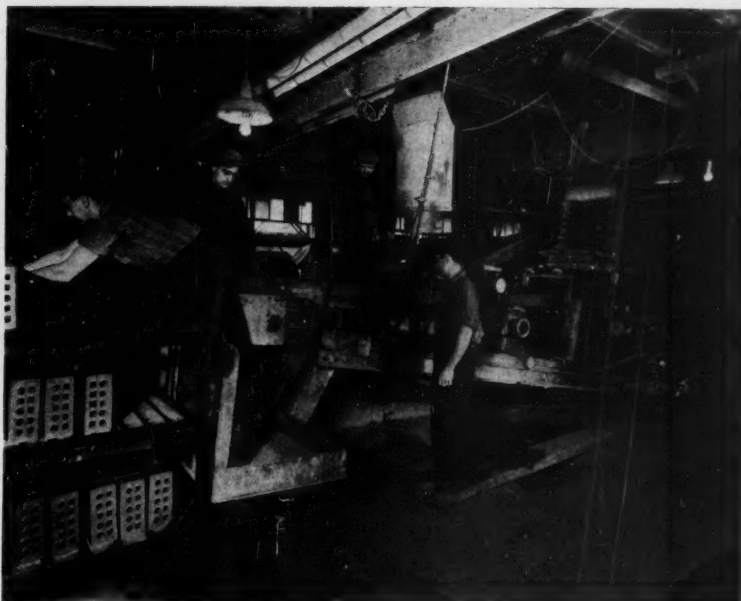
fer truck thus moves the drier cars in a continual shuttling operation on the shorter (and lower) road bed that runs at right angles to the longer tracks.

The 300-ft. long drier building can accommodate approximately 43 of the 7-ft. long cars on each track. A hydraulic ram moves the cars at a slow pace through the drier by means of specially designed

individual connections that apply energy to each car. ("Q" shows that the movement is toward the

(Continued on page 56)

Figure 3—Immediately back of circular-type cutter is the pug mill and extruder machine. Note that the delivery of the cutter is suspended on cables, which are operated by a hydraulic ram. As the delivery is elevated and lowered, workers on platform are properly positioned for loading operations.



MODEL LAYOUT . . .

(Continued from Page 17)

Three-Dimensional Model Layout

A noteworthy feature concerns the use of $\frac{1}{4}$ " three-dimensional models in planning the production aisle, which comprises two lines for two projectiles of different sizes. (See flow diagram.) Little time was allowed by the Navy for the whole project, which was completed in five months—from design and procurement to manufacture. To help visualize the ultimate manufacturing layout, and save time and money in rearrangement, a three-dimensional model was constructed to an accurate $\frac{1}{4}$ " to the foot scale.

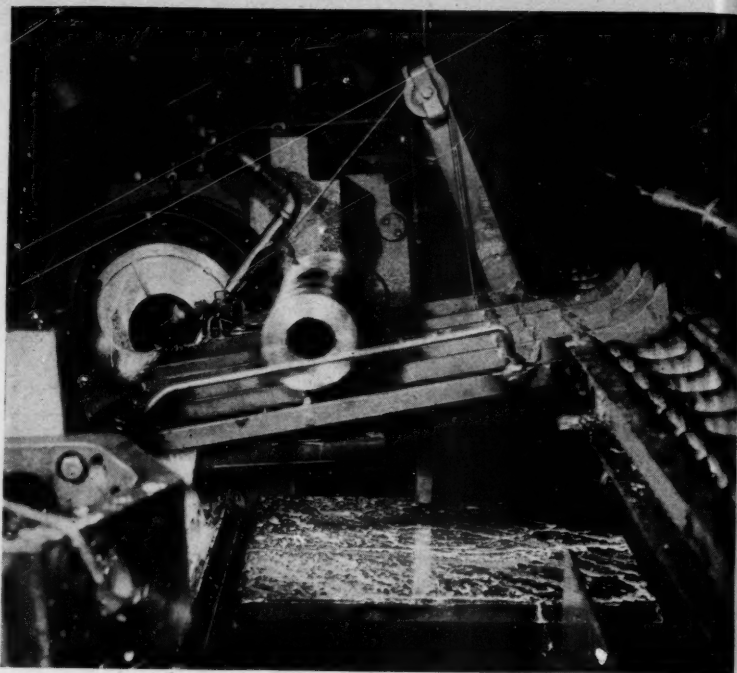
With models of men, machines, and conveyors, it was possible to see that material would arrive at and flow from work stations at the correct height for greatest ease in handling. This was an important detail since the larger type forging weighs about 65 pounds, the smaller one approximately 20 pounds. Since standard models representing men 5' 8" in height were cast with outstretched arms, all operators have sufficient working space. The models needed only to be pivoted at their work stations in order to check the required working areas.

Another example of the value of the models was illustrated in solving the problem of temporary storage space. By making a miniature layout and studying crane handling facilities, maximum use was made of minimum space. Both lines occupy a total space of 42,685 square feet, exclusive of such auxiliary adjuncts as gage and tool grinding rooms, metallurgical laboratories, supervision and engineering offices, and temporary storage space.

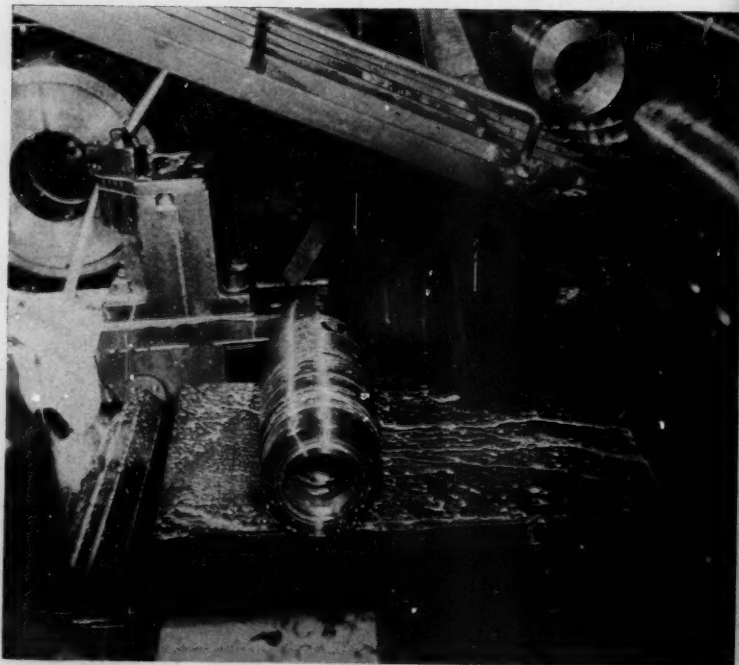
Not only was the model an aid to the plant engineering staff but also to the Navy, whose engineers could better understand the arrangement and offer suggestions than if the layout had to be visualized from two-dimensional paper templates. It is on projects of this kind, involving a large expenditure of money and a complexity of materials handling equipment, that the educational value of the models more than offsets their additional cost.

Receiving, Storage

Forgings arrive by freight car on the spur bisecting the outside stor-



Above: A tray conveys the projectile from the conveyor line to lathes. Below: After the lathing operation, the projectile moves onto the lower strand of the conveyor via a take-away tray. Total time consumed for handling the projectile from the conveyor line to the lathe has been reduced to 7 seconds, including chucking, by the use of this special tray. It is equipped with counter-balance for ease of manipulation.



age area. Both the smaller spinner head, manufactured on line No. 1, and the larger HVAR projectiles, produced on line No. 2, are unloaded by portable gravity roller conveyor sections and stored on

dunnage strips in separate piles according to heat and code number. (The pieces in each shipment are thus separated since they come from different suppliers and vary in chemical properties.) Aisles be-

tween the piles were arranged for easy maneuverability by fork and platform trucks.

The lighter spinner head is broad-based and short. It is loaded onto steel-bound platforms and brought by platform truck to the head of the conveyor line. The HVAR forgings, which resemble 5-in. artillery shells, are taken from the stockpile by a fork lift truck equipped with a special pronged attachment. As the truck runs up to the pile, the prongs are projected into the cavities of the projectiles, which are brought 40 at a time to the conveyor line.

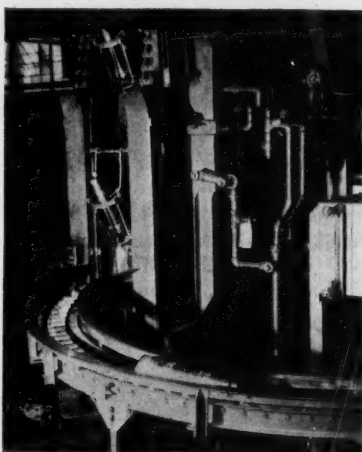
Into Production

As the flow diagram shows, both lines start in the infra red drying room, passing between two banks of lamps which remove moisture that would clog the nozzles of the shot blast machines. These powered sections discharge onto the two gravity roller lines.

Work moves to and from the stations with minimum handling by operators. No worker has to move more than two feet maximum to and from his machine either to get raw material or to dispose of the finished job. The conveyors are gravity operated, with powered belts wherever necessary in order to bring work to the man at waist or chest level. The layout differs from most jobs in that each work station, consisting of from one to six machines, is connected in sequence. This arrangement makes for increased efficiency and lower unit cost. "Hospital zones," or repair stations, are spotted at several

points along the lines to repair minor defects which may occur during manufacture.

Handling time is materially reduced on lathes used for finished cuts (on the larger HVAR) by a specially designed tray (see photo) which is pivoted on the conveyor and counterbalance for ease of manipulation. Fabricated of light steel stock, it handles the shell, weighing 35 pounds at this point, into or out of the machine in 7 seconds, including chucking. Four arms with the same curvature as the shell casing fit between the rollers on the conveyor and extend back to a stop which is in line with the chuck. The operator merely tilts the end of the tray in order to pick a shell from the conveyor, and



Mechanical unloaders remove the HVAR head of the projectile from the degreaser. Note tilting arrangement of arms which make the operation completely automatic.

slides it into the chuck. The counterbalance on the tray eliminates the weight factor. It automatically goes up into position when it is released.

After the operation, the shell moves over the take-away tray to the lower deck of the conveyor. Throughout the system, the rough pieces thus move over the top lines, while the finished pieces move over the bottom lines.

Mechanical loading and unloading devices, connected with the conveyor lines, handle the pieces into and out of the enclosed processing machines. An example is the mechanical unloaders shown emerging with shells from the degreaser at the top of this page.

Because approximately 30 lbs. of metal are removed from the larger

forgings (about 8 lbs. from the smaller spinner head), adequate provisions were made for removing the considerable amount of chip and turnings from the compact layout. The sizable scrap cans at each work station are removed by overhead cranes which cover the entire bay. The cans are dumped directly into freight cars or trucks at the head of the line. This good housekeeping and safety measure is an important consideration in view of the large quantities of steel that are handled in the compact layout.

Packing and Shipping

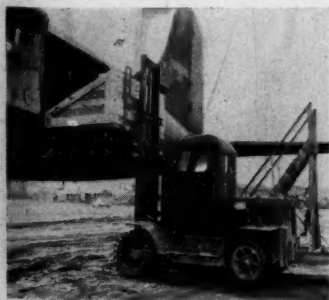
As the finished pieces come off the paint, spray, and air dry operations (following final inspection), they are discharged onto the packing conveyor which feeds them directly into standard boxes. Temporary storage for empty boxes is provided on a parallel section of gravity roller conveyor, which brings them to the point of use. The loaded boxes are stacked on double-faced pallets.

The railroad track that runs into this end of the building is approximately 35 feet from the packing station. Formerly the boxes were loaded individually into the cars by means of portable powered belt conveyor. In view of the handling economies of palletized unit loads, however, a new arrangement has been worked out.

For loading purposes, a portable platform on a level with the freight car door was constructed, and this is placed against the car. A fork lift truck places the strapped palletized loads on this platform, which are moved and loaded into the car by a powered hand lift pallet truck. While the fork truck could place the pallets directly into the car, the use of the platform gives the operator of the powered hand lift truck the necessary maneuverability. In case of necessity, a second platform is available which is placed against the opposite door for additional maneuverability while the operator is loading the center of the car.

Thus every aspect of materials handling was pre-planned. While the compact project has served the Navy well in war, the efficiently planned layout and materials handling operations may well be adapted to production of peacetime goods.

GOING UP . . .



In this photograph a fork truck is elevating cargo to the deck level of one of the Navy's large transport planes. The portable bin, was developed for the placing of smaller cargo during route sorting operations. Note wheels on loaded truck.

—U.S. Navy Official Photograph



MOTORIZED TRUCK

A motorized load-carrying truck is announced by Lift Trucks, Inc., Cincinnati, Ohio. This new truck has a stationary bed. Heavy loads are placed on the truck by hand, crane, or otherwise. The safety rated capacity is 4,000 lbs. Finger



tip control permits easy maneuvering of the heaviest load forward or back to destination, it is stated, and provides easy starting and stopping. Finger control is provided by two buttons on the handle, one for forward motion and one for reverse, operating in conjunction with a controller unit. It is claimed that a forward or reverse speed of 312 feet per minute when empty may be attained, and 220 feet per minute, loaded. Power is generated by heavy duty batteries (10 to 20 hours' operation under maximum load without recharging).

ELEVATING TABLE

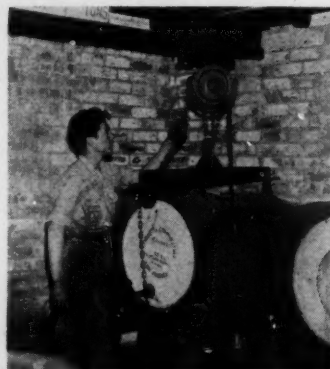
Lyon-Raymond Corporation, Greene, N. Y., have added another optional feature—a telescopic towing handle—to their Hydraulic Elevating Table. Extended, the handle provides means for easily moving the table from place to place. Collapsed, the handle is below and under the table top where it will not interfere with operations involving the transfer of materials across the table or the support of overhanging pieces.



The table can be readily maneuvered without use of the handle, but long hauls are easier with it.

BARREL GRAB

The American Monorail Company, Cleveland, announces a low headroom barrel grab of simple

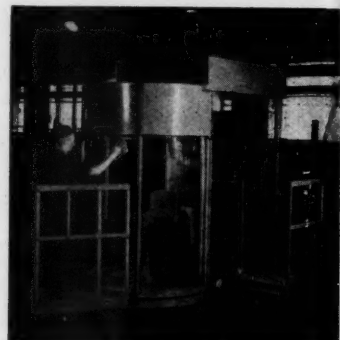


construction, using angles and cut plate. Adjustable to accommodate various sizes of barrels through setting of one prong of grab in various holes, drilled through the angles, this new grab will have widespread applications where handling of drums and barrels is a problem.

OVERHEAD CRANE CAB

Overhead traveling crane cab design has been changed by the Cleveland Crane & Engineering Co., Cleveland, to include full vision for the operator, comfortable sit-down control and air condition-

ing. The transparent enclosure panels extend to the floor, permitting maximum vision in every direction. A traveling platform serves both as vestibule of the cab and as a means of easy access to the

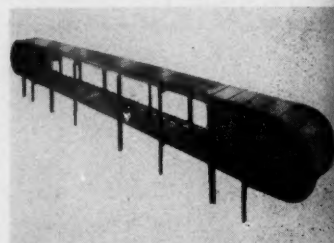


entire exterior side of the window for cleaning. This new cab is a self-contained unit which can be applied to existing cranes of any make. It is 6'6" high and 4'6" in diameter.

ALL-STEEL CONVEYOR

AN ALL-STEEL conveyor belt developed on a new principle has been announced by the Steel Parts Mfg. Corp., division of the Blackstone Mfg. Co., Chicago.

Said to be built on an entirely new and fundamentally different principle, the "Steelok" conveyor belt is made up of a series of steel plates linked together at the ends. This makes for ease of maintenance, because, should a belt plate become damaged, it is only a few seconds work to slip out the damaged plate and insert a new one.



The belt is driven by a simple drive-sprocket that meshes with the hinges of the belt, providing a positive non-slip movement.

The manufacturer asserts that there is no sag at any point along the belt length, and no open spaces between links, so that a perfectly flat working surface is presented at every point. This feature makes the belt especially adaptable, it is

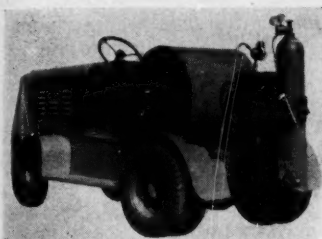
closure
permit-
ing di-
serves
ab and
to the

claimed, to assembly line and packaging applications. Links mesh with the drive sprocket, and the belt is held taut throughout its length, to eliminate the clashing of steel on steel.

The only exposed moving part is the belt itself. The drive sprocket and motor are enclosed, and the edges of the belt are provided with a guard rail. This is specially important on assembly line applications where worker-safety is an important factor.

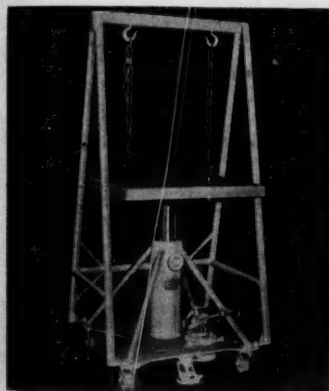
MOBILE WELDING UNIT

A mobile electric arc and acetylene welding unit ("Shop Mule" Model J233 WL) is announced by W. F. Hebard & Co., Chicago.



With this setup provision is made for both types of welding in any part of the plant and in yards. The tractor can be used also to haul two trailer loads of material from one point to another, or can be equipped with a snow plow, etc.

DIE SEPARATOR



An optional feature for their portable hydraulic lifting table is announced by the Lyon-Raymond Corporation, Greene, N. Y., in their die separator. It consists of a tubular superstructure which fastens to the base of the table by four bolts with wing nuts. Being readily demountable, the die separator does not limit the use of the table, which may be made

available for the transferring of dies in and out of presses, supporting overhanging materials, an adjustable height assembly bench and many other handling and work positioning tasks.

NEW CAR PULLER

The American Engineering Corporation, Philadelphia, announces a Class 2½ Lo-Hed Car Puller. This is a husky hauling device in which the barrel, gear box and motor are integrated in a single, streamlined unit. Starting line pull is said to be 5,000 lbs., using a sin-

gle line, or more with various block combinations. Uses of the car puller range from hauling railroad cars of all types to pulling skids, powering boat and airplane runways, dragging logs, bending pipe and numerous other back-breaking operations.

PAPER SHIPPING PALLET

THE development of a one-way paper board shipping pallet has recently been announced by Old King Cole, Inc., Canton, Ohio. It is designed, according to the manufacturer, for a one-

Here are **IMPROVED** ways to
✓ **HANDLE MATERIALS...**
✓ **POSITION WORK...**

LYON-Raymond Hydraulic HIGH-LIFT TRUCK

Modern welded tube and formed plate construction. Light, strong, rigid and safe. Only half the weight of an ordinary tiering truck of equal capacity.

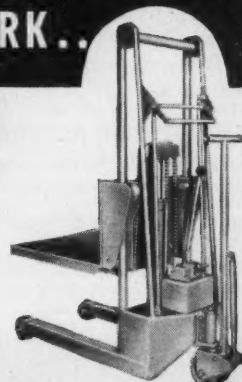
LIFTS & TRANSPORTS. Will pick up a skid load as handily as the usual type of lift truck. Easily steered into small space.

SUPPORTS. An adjustable support for over-hanging work on drill presses, shears, cut-off machines, punch presses, etc.

POSITIONS. Adaptable to positioning work in lathes; loading and unloading heavy work from other machine tools.

LOADS & UNLOADS. One man can do the work of many in loading and unloading freight. Especially convenient where docks are not available.

TIERERS. Easily maneuvered and elevated for tiering.



LEVELS. Exact leveling for changing dies in presses. Ideal for transporting heavy die sets, fixtures, tools. Write for bulletin 136.

LYON-Raymond
also manufacturers
Hydraulically Operated—
Lift Trucks

Pallet Lift Trucks
Pumps—Foot & Hand Operated

Hoisting and Tiering Trucks
Die and Sheet Handling
Equipment

Die Testing Presses
Elevating Platforms—
Stationary Type

Engineered Hydraulic Devices



Write for
BULLETIN
133

LYON-Raymond Hydraulic ELEVATING TABLE

1. Positions for easy transferring of dies in and out of press.
2. Transfers work from one level to another — height positioning.
3. Feeding sheets to shear or press.
4. Adjustable support for over-hanging work.
5. As a work table it positions work at right height for all workmen.
6. As a low priced Welding Positioner.
7. Loading or unloading motor trucks.
8. Positioning through hydraulic elevation and full rotation of top in either direction.

LYON-Raymond
Corporation

465 Madison St. Greene, N. Y.



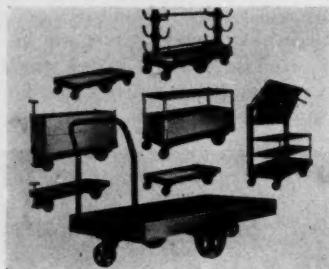
way trip, to be disposed at destination. Dead weight in shipping is reduced by its light weight of 1.8 lb. per sq. ft. A special impregnation treatment is said to make it impervious to water. While this is not a warehouse pallet, the manufacturer claims that it will stand up under all normal shipping work.

STANDARDIZED ACCESSORIES

The Market Forge Company, Everett, Mass., announces a new line of standardized industrial trucks and accessories. The trucks are equipped with deep stake pockets at each corner, making it pos-

This 5,000-lb. load of brick rests on a single-face paper board pallet, recently announced. The single-face model will support loads of 630 lbs. per sq. ft., the double-face model slightly more, but when used for tiering the load must be reduced.

sible, it is claimed, to completely convert the truck from one type of load carrier to suit other requirements simply by the addition of



standard available accessories. The basic floor truck is said to be built to carry up to 5,000 lb. loads. The undercarriage is so designed that any one of its six caster and wheel arrangements may be adapted and applied for various conditions.

4-WAY FLOOR PLATE DECK

In the application of 4-Way Floor Plate to a standard transport chassis the floor plate is welded flush with the top of the chassis on

the angles of the frame. It is reinforced on the under side by two heavy angles. The "non-skid" feature keeps metal parts from "walking" off easily when the transport is in motion. Further, the embossments are said to provide point contact with hot materials which allows some air space between them and the steel deck.

OLDEST INDUSTRY . . .

(Continued from page 51)

pusher. The sturdier kiln cars, on the other hand, are pushed by the hydraulic ram ("S") from the rear, the energy being applied only to the last car in the train.

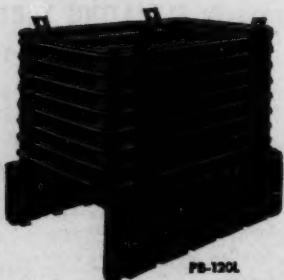
Every time the drier ram advances a full length (approximately 7 feet, or the length of a car), a car is taken out at the discharging end and another is added on the charging end. The trains thus form a connected "belt line" as they move through the building.

The cars of dried brick are moved by transfer truck to the east end of the long inside track shown in the foreground of the simplified flow chart. At point "R" the dried bricks are transferred manually to kiln cars. The individual kiln cars,

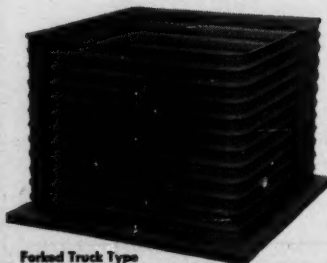
How to make your plant deliver MORE PAY LOAD!



PB-120



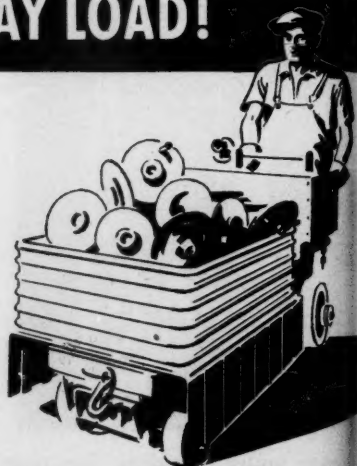
PB-120L



Forked Truck Type

More efficient storage of parts and materials . . . at strategic points throughout your plant! More efficient movement and delivery of this material to production lines!

You secure these cost-reducing advantages when you use Truscon Steel Boxes and Skid Platforms to TRUSCONVEY anything that involves moving operations in your plant. They can solve a wide variety of handling problems, simplifying operations, speeding production, encouraging profits.



Write for illustrated catalog showing many different types and sizes of Truscon Steel Boxes and Skids, and describe your materials storage and movement problems.



TRUSCON STEEL COMPANY, Pressed Steel Division, Dept. F • 6100 Truscon Ave., Cleveland 4, Ohio • Subsidiary of Republic Steel Corporation

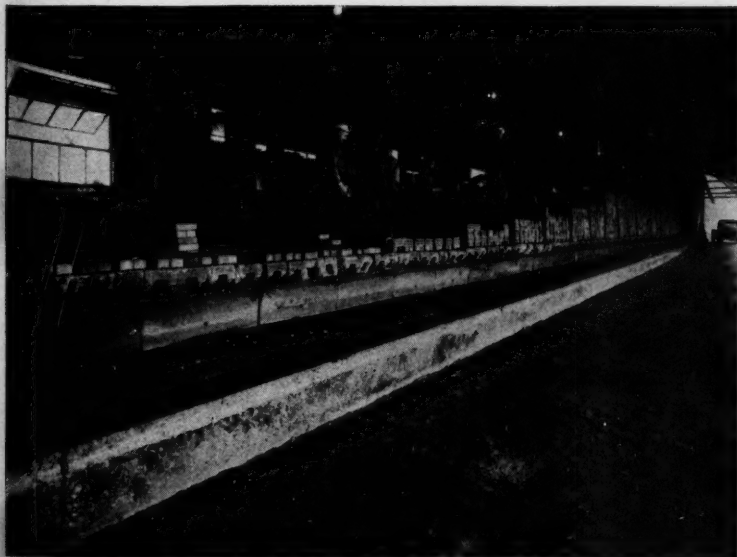


Figure 4—A car of dried brick about to be advanced from transfer truck to kiln track.

too, are moved by transfer truck to the kiln track, which passes through the 350-ft. long kiln tunnel. The hydraulic ram advances the cars through the kiln at the rate of 7 feet every 45 minutes. Here, too, a car is added to the charge end every time one with fired brick is removed from the discharge end.

The kiln cars loaded with finished brick are handled as a continuous "belt line" on the loading dock as well. "X" is the hydraulic ram that keeps the cars on this track inching forward at the rate of 7 feet every 45 minutes. The scarcely perceptible movement con-

Figure 5—"Belt line" of kiln cars, foreground, being loaded with dried brick from drier cars, rear. Advancing ram keeps line moving constantly; when one car is moved to kiln from extreme right end, another car with fired brick is brought to unloading station at opposite end.



tinues as the cars are being unloaded at the east end ("Y"), and also as they are loaded again with dried brick on the west end of the track. (In order to clearly show the track system, only single cars are sketched on the flow chart.)

Thus the double track system is arranged as a "circle within a circle," with powered trucks effecting the transfer of the cars from the loading tracks to the drier and kiln, and again from the drier and kiln back to the unloading stations on the shipping dock.

"Oldest Industry" Looks Ahead

While the brick industry is usually referred to as "the oldest one of which there is any record," plants like the Ohio Clay Company employ a maximum of mechanical handling devices that practically tie all operations into a continuous process system.

At present the company's management is studying the few manual handling operations that still remain. These include the hacking of green brick from the cutter, the transfer of the dried brick to the kiln cars, and the loading of the finished product into trucks and freight cars.

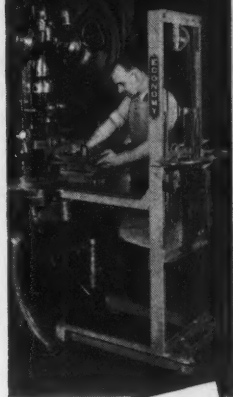
The handling of the green brick from the cutter to the drier cars represents a special difficulty, due to the plastic quality of the clay. In time, however, this handling operation may be mechanized along with the transfer of the dried brick to the kiln cars, and the loading of the finished product.

Save production time with a SHOPLIFTER

ONE-MAN OPERATION

LIGHT-COMPACT

EASILY MOVED ABOUT



Handling Dies, Fixtures, etc.
Loading Trucks
Miscellaneous Lifting Jobs
Capacity 500 lbs.
Lift of Platform—4'6"
Overall Height—6'0"
Platform Size—24"x24"

PRICE \$147.50
Full Freight Allowed

Foot operated floor lock \$10.00, optional

QUICK DELIVERY

Heavier Capacities Available

ECONOMY ENGINEERING COMPANY
2677 W. Van Buren St., Chicago 12, Ill.

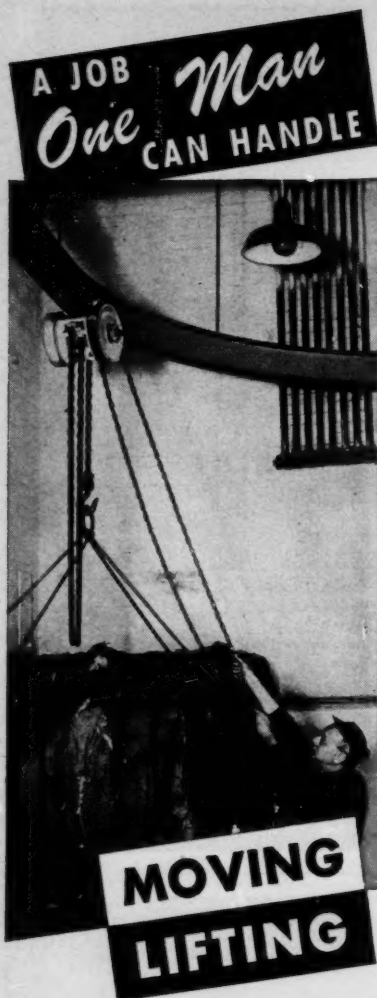


Buschman Portable Conveyor

transports by gravity, to and from trucks, box-cars, production lines, warehouse storage. Convenient to carry from place to place where needed. In 10' and 5' straight sections (also curves), quickly, easily set up and coupled to any length, without tools. Sturdy stands are adjustable in height.

Write for Bulletin 10

The E. W. Buschman Co.
432 New St. Cincinnati 2, Ohio



For moving bales, boxes, crates, drums, barrels with limited manpower, the Reading Multiple Gear Chain Hoist provides a practical solution.

Loads up to 2 tons can be lifted by one man. The load brake holds positively till released. Where I beam trolleys are used, loads can be moved with ease by one man.

Long life is insured by the sealed-in-oil gear unit—an exclusive feature. The all steel construction from hook to hook gives high overload capacity—guaranteed 25% over rated capacity.

See your nearest Reading Hoist distributor for help on your materials handling problems or write direct.

READING CHAIN & BLOCK CORPORATION
2115 ADAMS ST., READING, PA.
CHAIN HOISTS • ELECTRIC HOISTS
OVERHEAD TRAVELING CRANES

**READING
HOISTS**



A SIMPLE and efficient method has been developed by the Cleveland plant of the Hinde and Dauch Company for unloading, stacking, and positioning roll paper used in the manufacture of corrugated paper board. These rolls weigh from 800 to 2,000 pounds each and are received in quantities of 1,000 tons a month.

The rolls arrive by freight car, loaded in a horizontal position. They are rolled out of the car into the plant entrance, where a fork

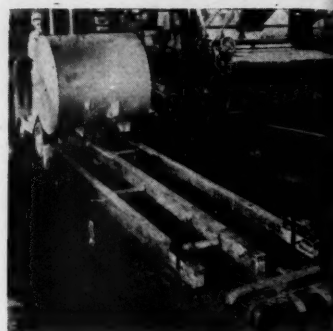


Figure 3



Figure 1

truck picks them up and moves them to the nearby storage area. Figure 1 shows how the truck pyramids the rolls on the stockpile.

The paper is also moved by truck from storage to the specially designed rack near the corrugating machines. (Figure 2.) As the end roll is pulled out by means of the



Figure 2

tapered forks, the two upper rolls slide down gradually. Since each roll in the bottom tier is blocked,

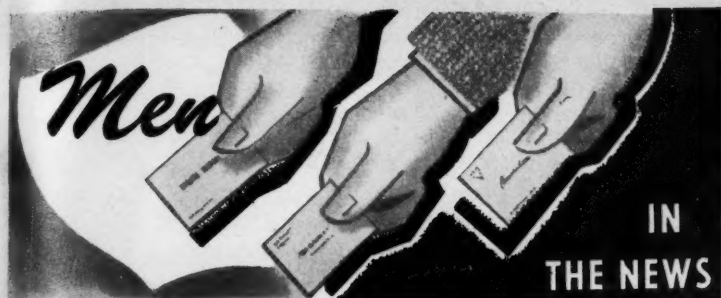
shifting of the other pyramided rolls is prevented.

Figure 3 shows the truck placing a roll for convenient handling near one of the corrugating machines. The wooden rack, made of 4" x 6", is tilted at a slight angle and equipped with blocks at the lower end. The individual rolls are transferred from the rack to the 6-wheel dolly shown, which moves them to the machine for shafting.

Under the old set-up, using different handling methods, from three to four operators were required to unload the rolls and move them into storage. Now one operator manages the whole job easily with a power truck.

It is significant that this operator is the full-time raw material handler of the relatively small plant employing only 35 productive operators. The management realizes that even in a plant of this size excessive handling costs can amount to several thousand dollars annually. And hence, it feels, the reduction and control of handling costs apply as much to the small plant as to the large.

Comparative cost figures show that among Hinde and Dauch's 12 plants the handling costs of the Cleveland plant are regularly in the lowest category, rating either first or second place.



R. D. Birge

APPOINTED Detroit representative of Philco Storage Battery Division, *R. D. Birge*. Mr. Birge formerly was with Louis Allis Company, in Detroit and Philadelphia.

C. *W. GUYATT* has been appointed Assistant to the Chairman of the Operating Committees for the U. S. Steel Corporation of Delaware. Mr. Guyatt formerly was chief industrial engineer of the American Steel and Wire Co., going to that company after six years with the Public Service Corporation of New Jersey. He will be located in Pittsburgh and will assist Mr. C. B. King in the establishment of production standards for all U. S. Steel subsidiary manufacturing companies.

APPOINTED Director of the Production Division of the Manufacturing Department of Caterpillar Tractor Company, *William Naumann*. Since the 19th of January Mr. Nauman has been factory manager of the Caterpillar plant. The division, a new organizational setup, will place inventory control, factory burden, work scheduling and related activities under one control.

APPOINTED District Sales Representatives for the Detroit area by the Towmotor Corporation, *Frank Colker* and *Thomas F. Maloney*, both of whom have been engaged in sales and application engineering of industrial trucks in this area for some time.

HENRY E. MacARTHUR has been appointed Manager of the Repair Department of the Westinghouse Huntington, W. Va., plant. MacArthur formerly served in the Newark, N. J., plant.

NAMED as Manager of the Middle Atlantic District of the same company, *H. B. Laidy*, transferring from the Wilkes-Barre, Pa., Manufacturing and Repair Department. *R. J. Miller*, Acting Manager of the Middle Atlantic District, has been transferred to the Emeryville, Cal., plant.



R. W. Berg

Works and the Irwin Works of the Carnegie-Illinois Steel Co.

RICHARD W. BERG has been appointed District Engineer for the Pittsburgh territory of the Bantam Bearing Division, The Torrington Co., South Bend, Ind. Mr. Berg was formerly with the Mesta Machine



C. H. Saiter

CREATION of a new sales division known as the Heavy Machine Division with headquarters in Wickliffe, Ohio, is announced by the Cleveland Crane & Engineering Co. The division will be held responsible for the sales of heavy overhead traveling cranes, bending presses, bulldozers

HERTNER

Fully Automatic

BATTERY CHARGING EQUIPMENT

for any

Battery Powered

**Truck,
Vehicle
or
Locomotive**

*42 Years of
Leadership!*

SEND US YOUR BATTERY CHARGING PROBLEM TODAY

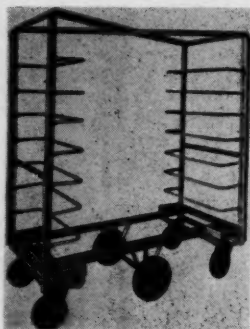
The Hertner Electric Co.

12690 Elmwood Ave.,

CLEVELAND 11, OHIO

TOWSLEY FLOOR TRUCKS

"Since 1886—for those who want the best!"



• Quality floor trucks for every materials handling purpose. Special trucks designed and built to meet your individual requirements. Without obligation, consult our Engineering Department.

Write for Standard Catalog

TOWSLEY TRUCKS, INC.
1770 Elmore St., Cincinnati 23, O.

and special machinery for the company. *Charles H. Saiter* has been appointed Sales Manager. He was formerly with the heavy crane department of the company for twenty-three years.



R. K. Carson

APPOINTED Sales Engineer at the Detroit, Michigan, branch of the Heppenstall Company, *Ralph K. Carson*. Mr. Carson formerly was with the Kelsey-Hayes Wheel Co. of Detroit, and the Pittsburgh Crucible Steel Co. and Bethlehem Steel Co. *L. A. Daines* announced that *James C. Patton, Jr.*, formerly in the Detroit branch, has been appointed district sales representative for the company in Chicago.

APPOINTED General Traffic Manager of the U. S. Steel Supply Company, with headquarters in Chicago, *Fred W. Eisel-*

stein, who was formerly with the Office of Defense Transportation in Washington.

APPOINTED head of Material Handling Division of Market Forge Company, *Everett, Mass., Nathaniel Warshaw*, formerly with Murray C. Tregurtha Corporation, Service Caster & Truck Company and Lewis-Shepard Company. Mr. Warshaw is a member of S.A.E. and A.S.M.E. He has been a pioneer in the development of several well known production processes and fabricating techniques in the welding and high pressure hydraulics fields. Market Forging Company has established a Standardized Department in its Material Handling Division (which Mr. Warshaw is heading) to coordinate the company's regular items with the general needs of industry.



N. Warshaw

BULLDOZER FORKS



Figure 1—Bulldozer equipped with forks on the blade.

WITH a limited supply of critical equipment, ingenuity has made it possible to



Figure 2—Closeup of application. use many methods which have had a limited application for a great

REVOLVATOR PORTABLE ELEVATORS

Lower Your Costs for Material Handling

Whether or not you have reconversion problems, now is the time to install more efficient and economical material handling equipment. That means **REVOLVATOR** (Reg. U. S. Pat. Off.) **PORTABLE ELEVATORS** and **RED GIANT LIFTRUCKS**. The two work together to save you much time, labor and space for all piling, stacking and moving. Other models for servicing high ceilings, press feeding, etc.

Write or phone us your requirements and we will send appropriate bulletins.



RED GIANT LIFT TRUCKS for use with platform skids and **REVOLVATOR** portable elevators are safe, durable and economical.



103 NMT 24—Telescopic **REVOLVATOR** for piling close to the ceiling between roof trusses.

REVOLVATOR Co.

DESIGNERS AND MANUFACTURERS OF MATERIAL HANDLING EQUIPMENT

2039 86th STREET

NORTH BERGEN, N. J.

Since 1904

many uses. This bulldozer equipped with forks on the blade is not recommended for full-time operation. But where fill-in work can be performed by the addition of forks, increased utilization of this equipment can be provided.

DOWN IT COMES



An extremely simple but very useful gadget made by bending and welding some lengths of pipe to form a barrel chute is shown in the illustration. It's easy to make.

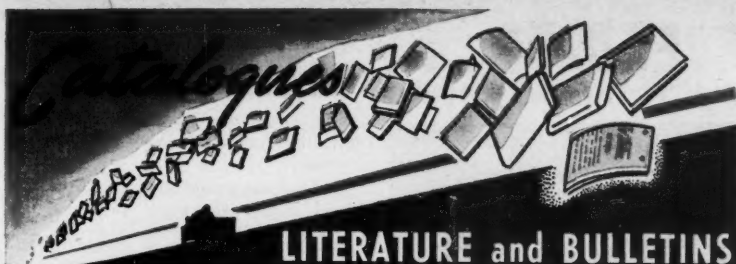


Practically every piece of material handling equipment is made with ball or roller bearings. If you will maintain the bearings properly, your equipment will last indefinitely. Here are some simple rules:

1. Keep your bearings clean and away from moisture.
2. Handle bearings with clean hands, and as little as necessary. Perspiration from the hands starts corrosion.
3. Don't wash the oil or grease out of a new bearing.
4. Don't take new bearings apart.
5. Keep the bearings in the original cartons until used.



Semi-trailers for picking up scrap and waste materials are easily operated. Rubbish is dumped at incinerators for inspection by means of the fifth wheel hoisting mechanism. Trailers have a capacity of from 21 to 32 cubic yards. Semi-trailer here is in 30° position to tractor.—Courtesy, General Electric Co.



LITERATURE and BULLETINS

The publications featured on these pages were written by experts. They are FREE publications. To obtain these write to FLOW MAGAZINE, 812 HURON ROAD, Cleveland, 15, Ohio.

1—Moving, Lifting . . . The part that chain hoists can play in minimizing manpower for the moving of bales, boxes, crates, drums and barrels is described in a folder released by the Reading Chain & Block Corp.

2—Faster Material Handling . . . Information on tire-tube wheels and engineering and design data for use on new products and modernizing old material handling equipment, available from the General Tire and Rubber Co.

3—Portable Conveyors . . . A presentation by the American Conveyor Co. on the use of conveyors for bulk material, ashes, cinders, grain, etc.

4—The Art of Piling . . . A 32-page, fully illustrated booklet on the efficient piling of bales, boxes, bundles, barrels, both indoors and out, released by the Revolver Company.

5—Off-Time Charger . . . A complete presentation by the General Electric Co. on the automatic charging of electric truck batteries, including technical data on battery charging requirements by type of unit involved.

6—Handling Platforms . . . Superstructures designed for handling materials on production lines are described in this bulletin by the Ironbound Box and Lumber Co.

7—Modern Materials Handling Machinery . . . A fully illustrated 96-page book on equipment, methods and engineering involved in handling all types of materials, both on the receiving and

shipping platforms and in production lines. A Yale & Towne Mfg. Co. release.

8—Speed-Up . . . A presentation by Speedways Conveyors on the use of portable gravity conveyors in light weight handling operations.

9—Applications Manual . . . A 56-page, fully illustrated booklet showing practical "how to do it" ideas, through the use of monorails. An American Monorail Co. presentation.

10—Sectional Portable Conveyors . . . A presentation by the E. W. Buschman Co. on conveyor units in the portable type straight and curved sections. Couplings and adjustable stands are included.

11—Collapsible Shipping Boxes . . . A presentation by C. H. Dresser & Son, Inc. on the use of collapsible shipping containers for use and reuse in "many-trip" applications. There is a description of applications in a number of interesting problems.

12—Caster Catalog . . . A 40-page publication on casters, wheels, and their probable selection in carefully enumerated problems, offered by Divine Brothers Co.

13—Lifters . . . A 32-page description by the Economy Engineering Company on various methods of lifting heavy and light materials on skids, pallets and in many bag, barrel, roll, drum and crate applications. Suggestions on stacking and the use of lifting

(More Literature on Next Page)

MAIL THIS COUPON FOR FREE LITERATURE

Flow Magazine, 812 Huron Road, Cleveland 15, O.

I should like a copy of the literature listed below:

NO. _____	NO. _____	NO. _____	NO. _____
NO. _____	NO. _____	NO. _____	NO. _____
NO. _____	NO. _____	NO. _____	NO. _____
NO. _____	NO. _____	NO. _____	NO. _____

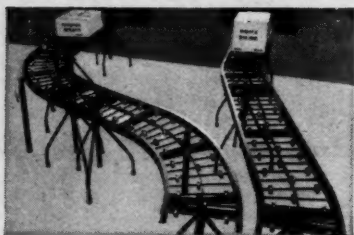
NAME _____ POSITION _____

FIRM _____

MAILING ADDRESS _____ ☐ HOME ☐ BUSINESS

CITY _____ ZONE _____ STATE _____

SPEED-UP . . . MATERIAL HANDLING



with SPEEDWAYS,

the modern, lightweight, portable gravity conveyor being used successfully by manufacturers, breweries, transportation companies, bottlers, warehouses, packing rooms, stores, etc. Now available—immediate delivery. Increase efficiency, save time, labor, cut costs!

STURDY CONSTRUCTION . . . frames are all welded steel . . . ball bearing rollers . . . built for years of service . . . no wearing parts!
LIGHTWEIGHT . . . weighs only 7 lbs. per foot . . . one man can easily carry a 10 ft. length!

IMMEDIATE DELIVERY of 5 and 10 foot straight sections; 45° and 90° reversible curves; 3 sizes of adjustable stands; Sections are easily joined without any tools!

SPECIAL MODELS . . . from 4½" to 18" wide—from 6 to 24 wheels per foot. Prices and description upon request.

DELIVERY FROM STOCK!
Agents in PRINCIPAL CITIES



3078 Main Street

Buffalo 14, N. Y.

VITALITY PARASITES THESE CANS

... PROPER HANDLING
PLATFORMS WILL
HELP PREVENT DRAIN
ON WORKER ENERGY

Our representative will be glad to discuss with you the possibilities of safer-faster production with special superstructures designed for handling heavy materials on production lines.



PROTECT EMPLOYEES
REDUCE WORKER FATIGUE
BUILD BETTER MORALE



Write For Bulletin 40

IRONBOUND BOX & LUMBER CO.

Materials - Handling Division

30 HOFFMAN PLACE

HILLSIDE, NEW JERSEY



LITERATURE . . .

(See Page 61)

for maintenance work and specific suggestions for major industries are included.

14—Production Aids . . . An All-Steel Equip Company 16-page, illustrated booklet on steel boxes and bins for storage and handling bins.

15—Delivery Trucks . . . A Buda Company presentation on their half-ton shop delivery truck, showing its application and engineering specifications.

16—Bridge Ramps . . . An Elizabeth Iron Works' booklet on one-man bridge ramps for use between loading platforms and freight cars, including specifications.

17—Portable Elevating Work Platform . . . A description of a high-lifting portable work platform lift which may be moved to any part of the shop. This unit has a 4' x 15' platform which may be elevated to a maximum height of 15 feet. The Globe Hoist Company (Item 512).

18—Finger Tip Control . . . Publication on a Lift Trucks, Inc. development of motorized 4,000 lb. capacity floor trucks.

19—Stamping Conveyor . . . A data sheet by May-Fran Engineering, Inc. on a conveyor specifically designed for drop-thru operations.

20—Platform Trucks . . . Catalog

No. 44: 64 pages of completely illustrated material on platform trucks, two-wheel trucks, casters and wheels, dollies, etc., comprising the line of equipment manufactured by Thomas Truck & Caster Co.

21—Accessories . . . Material handling accessories, such as lift truck platforms, steel boxes, tiering boxes, platform units and specialized pans and pallets. A Powell Pressed Steel Co. release.

22—Uniform Feed and Automatic Discharge . . . An 8-page folder describing the Link-Belt Company's development for the handling of bulk materials. "Run-around" design traveling in a horizontal plane and continuous operation are described.

23—Cable Requirements . . . A wall chart giving the cable requirements for all of their equipment, especially prepared for operators and maintenance men. It describes the service angle and gives practical tips on how to get longer service from wire rope. An R. G. LeTourneau booklet.

24—Your Product—How To Ship It Safely . . . An illustrated pamphlet which explains the use of modern wire-bound containers in a variety of industries. Design problems and strength tests are included. This is a presentation by the Wirebound Box Mfrs. Association.

25—How To Handle It . . . A Chain Belt Co. description of heavy-duty conveying of bulk materials in cement mills, coal mines, foundries and other industries where very abrasive materials are being used. Engineering specifications are included.

26—Pallet and Platform Transporters . . . Engineering data on an automatic platform transporter showing typical application problems, including dimensional specifications of the equipment. Released by the Automatic Transportation Co.

27—In Operation . . . A 76-page publication by The Lewis-Shepard Company with a special file tab. There are special sections on Lift Trucks, Skid Platforms, Power Fork Trucks, Stackers, Cranes, Floormaster Floor Trucks, Storage Racks and a large selection of specially built equipment for unusual jobs in production, processing and storage.

28—Apron and Pan Conveyors . . . The Chain Belt Company in No. 440 describing its line of apron and pan feeders and conveyors. Apron and pan conveyors are used for handling coal, coke, ore, cement, rock, chemicals, bulk parts and many other materials. The bulletin contains design details, cross sections, capacity tables and specifications tabulated for quick comparison.

29—Barrel Conveyors in the Petroleum Industry . . . Actual operating installations in a number of plants are described in this 12-page fully illustrated brochure. Descriptions of the problems and equipment installations, with flow sheets. A Lamson Corp. booklet.

Ed: This catalog might help us—let's get one + see.

LVT import the pa in use

Fast

dling s

the loa

U. S.

same s

final

miles

observ

the pal

sound

the ori

FLOW

FLOW

FLOW

FLOW

FLOW

FLOW

FLOW

FLOW

FLOW

FLOW

FLOW

FLOW

FLOW

FLOW

FLOW

FLOW

FLOW

FLOW

FLOW

FLOW

FLOW

FLOW

FLOW

FLOW

FLOW

FLOW

FLOW

FLOW

FLOW

FLOW

FLOW

FLOW

FLOW

FLOW

FLOW

FLOW

FLOW

FLOW

FLOW

FLOW

FLOW

FLOW

FLOW

FLOW

FLOW

FLOW

FLOW

FLOW

855 = 50—Modern Arithmetic

(Continued from page 16)

LVT spare parts was extremely important. Palletization permitted the parts to be unpacked and put in use in minimum time.

Fast-traveling materials handling specialists sometimes viewed the loading of palletized units at a U. S. factory, then observed the same shipments arriving at their final destination thousands of miles distant. Repeatedly these observers have pointed out that the pallet loads arrived in the same sound condition in which they left the original shipper.

Specific Advantages

Palletization of the LVT spare parts at the Bryant Heater Company brought about a reduction of 10 to 12% over the former packing and loading cost, a saving which was passed on to the Navy. Several specific economies are reflected in this over-all figure, as follows:

(1) Less board feet of lumber were required for the pallets than were used for making up hundreds of boxes for each equipment. (2) Because each box was previously lined individually, a saving was effected in waterproof liner. (3) Carpentry costs were reduced materially, which is again partly explained by the large number of

boxes that had to be built before. Another reason is the elimination of the need of bracing each of hundreds of individual boxes. (4) Less strapping was needed for the pallets than was formerly used for the numerous loose units. (5) Hundreds of boxes required more storage area than was needed for 50 pallets, which could be conveniently tiered. The sizable saving in man-hours has been indicated earlier in this article.

WIRE ROPE CARE

(Continued from page 39)

Repair of the clutch and brakes and smoother handling of the dragline eliminated vibration and completely erased all record of fatigue of the cables used on the dragline.

This same operator investigated further and discovered that the cause of rope failure on his hoisting equipment was improper spooling or winding on the drums. Only a fraction of the service expected was being delivered because the rope was carelessly permitted to criss-cross on the drums. Several sections of the rope had literally been crushed to death.

The operator of this pit then had a talk with his men. The maintenance of wire rope, he explained, must start when the spool arrives on the job. In winding rope on drums, turns must be started correctly so that the rope lies flat and the strands do not cross each other. Right-lay rope must be started from the right flange of the drum as it is faced from the rope side, and left-lay rope from the left side.

Wire-rope performance on this hoisting equipment, after the cable was correctly spooled, was increased almost 100 per cent.

Correct Care the Answer

The experiences of these three distinctly different users of wire-rope might be multiplied many hundred times. The solution to your own wire-rope problems may be as simple as any of these. Select the rope best suited to your purpose. Then watch the maintenance and operation which you are giving the rope. Correct and regular maintenance and proper operation are answer to any wire-rope problem.

FLOW BREAKS A BOTTLENECK (Continued from page 25)

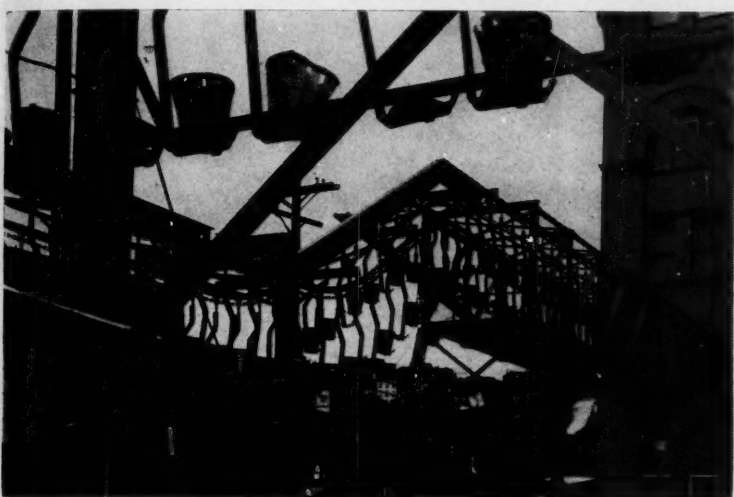


Figure 4—Showing "west" conveyor crossing street over trestle into manufacturer's building. It dips to processing floor and extends for 300 ft. unloading point.

MECHANICALLY SPEAKING

The drives of both conveyors are of the caterpillar floating type. Should one drive tend to take more than its proper load, the sliding frame will move back against the springs, producing a rotation in the gear pinion which automatically reduces the speed. Conversely, should this unit be taking less than its load, the frame will move for-

ward and speed up the drive. By this means all drives on the conveyors will automatically maintain their proper proportion of the total driving effort, regardless of load conditions.

Each installation is equipped with an automatic oiler, eliminating manual operation. Manual lubrication for the entire system would take two men four hours each, requiring a shut-down period.

former traffic confusion has likewise been eliminated.

During the balance of the year the conveyor system is used for transporting incoming trailer loads of knock-down cartons to the

storage area for plant distribution. In case of necessity, the carrier trays are also adaptable to miscellaneous raw material handling—a possible use which is being studied at present.

SAVE Time..Effort..Money



Automatic End Dump

For handling and dumping sand, castings, scrap, stampings and other heavy materials. Fits any fork or lift truck. Built of heavy steel plate reinforced with heavy angles. All welded construction. Rockers, geared to truck, are self-seating and smooth operating.

TWO STANDARD SIZES

	S-878-A	S-878-B
Capacity.....	1/2 Cu.Yd.	1 Cu.Yd.
Overall Length...	45"	66"
Overall Width....	36"	36"
Overall Height....	42 1/2"	46 1/2"
*Floor Clearance.	12"	12"
Space Bet. Legs..	29 1/2"	29 1/2"
Approx. Weight.	600 lbs.	750 lbs.
Finish.....	P.S.Gray	P.S.Gray
Price.....	\$8500	\$9500

*Can be supplied with any other floor clearance if specified when ordering.

Item B-339-A \$2500

Plain bearing metal wheels

Item B-339-B \$2750

Roller bearing metal wheels

Item B-339-C \$3250

Rubber tired roller bearing wheels



Shovel Truck

For pick-up and moving barrels, hampers or cases; sturdily constructed and easy wheeling. Overall height 48". Heavy steel nose plate, 19" wide at base, 13" wide at front. All welded construction. Two 6" diameter wheels. Convenient shaped handles of heavy 1 1/2" O.D. tubing. Weight 50 lbs.



Hand Dump Truck

Constructed of heavy sheet steel, reinforced with band at top edge, stout 3/4" round rod iron handle welded to truck. This truck measures 25 1/4" by 45" at the top and 25 1/4" by 27" at the bottom by 17 1/2" deep—carries about 1/2 cu. yd. and weighs 125 lbs. Equipped with two 8" semi-steel wheels and two 4" metal swivel casters.



Barrel and Box Grab

For picking up any type of wood or steel barrel, box or container, from 40" diameter down to small nail keg size. Capacity, 1-ton. Weight 35 lbs.



Barrel Truck

Handles with ease barrels weighing up to 1,000 lbs. Weighs but 85 lbs. To load, shove truck up against barrel or drum, then drop sliding steel catch over rim... pull toward you and truck loads automatically without rocking or tugging—loads from row as easily as when barrel stands alone.

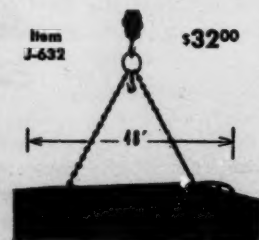
Sturdily constructed of heavy steel, two 10" roller bearing wheels. Greatest width only 22", permitting it to pass through aisles and doors too narrow for many trucks.

Item S-911-M \$3350

Equipped with metal wheels

Item S-911-R \$3850

Equipped with molded-on rubber wheels



Universal Grab

Use for picking up all types of heavy boxes, crates, bales or other loads where hooks may be used. Heavy, forged steel hooks with an adjustable spread of from 16" to 48". Adjustable for use where ceilings are high or low. Sturdy 3/4" BBB chains. Weight 27 lbs.



Spike Type Box Grab

For grabbing and lifting large, heavy boxes where the use of spiked grips is allowed. Gripper plates are fitted with replaceable cone-headed spike bolts. Model shown has 1000-lb. capacity; can be used on boxes up to 5 feet wide. Larger models are built proportionately heavier. Four sizes:

Item B-289-1 Cap. 1000 lbs. \$3750

Item B-289-2 Cap. 2000 lbs. \$5275

Item B-289-3 Cap. 3000 lbs. \$6825

Item B-289-4 Cap. 4000 lbs. \$9500



Item S-703 \$1475

Industrial Dust Pan

No shovel to bother with. Moves around in places too tight for a wheelbarrow. Very light to handle. Weighs only 45 lbs. Capacity one bushel. Exceptionally well constructed to withstand rough treatment in industrial plants.

The pan or metal basket which measures 18" x 18" x 18" is made of 16 gauge sheet steel, the frame of 1" x 1 1/2" x 3/4" angle iron, the handle of 1" tubing, all welded construction. The overall height is 48". Two 8" rubber tired, ball bearing wheels.



Item NS-364

\$15000

Complete as shown

Sheet Steel Grab

For handling sheet steel in bundles of any size lift up to 9" thick, 18" to 48" wide, and any length. "Grab" can be used single, double or triple according to size of bundle; illustration shows triple application. Capacity, one ton per "grab"—total, 3 tons. Holds sheets securely without slipping, distortion or damage to finish. Suited to high or low head room. Supporting beam measures 6' long. Heavily constructed. Weight 190 lbs.



Item NS-415

Utilities Rack on Wheels

\$5550

For handling parts or small items in course of production or assembly. Use at machine and also for conveying materials. All steel welded construction. Width 24", height 50" length 48" overall. Clearance between shelves 12". Four 6" roller bearing casters, two of which are rigid and two swivel. Weight 220 lbs. Finish P.S. gray.

Designers and builders of every conceivable type of materials handling equipment... for pick-up, loading, moving, dumping or storage... made of metal, or wood, or combination. Tell us what you wish to accomplish, and we shall gladly offer you our recommendations and quote you on handling equipment designed to fit your plant and your product.

NOTE:—Always order by "Item" number, this will prevent error. Accompany orders with priority to avoid delay. All prices f.o.b. Detroit. All weights are approximate. Finish is standard P.S. gray unless otherwise noted.

Palmer Shile Co.
7170 West Jefferson Ave., DETROIT 17, MICH.

Mathews

CHAIN CONVEYERS

*Engineered
to serve Production*



For heavy-duty work, such as illustrated above, where power conveyers are required, the pallet type Chain Conveyor is one of the most practical. It is capable of handling very heavy loads at carefully controlled speeds. The many different types of pallets available add to the flexibility of conveyers of this type. They can

be of steel or wood, and can be spaced at various intervals in the chain, or can be interlocking. There is a Mathews Engineer operating in your vicinity. Ask him about Mathews Chain Conveyers, and the many other types of Mathews Foundry Conveyers which have been engineered to serve production.

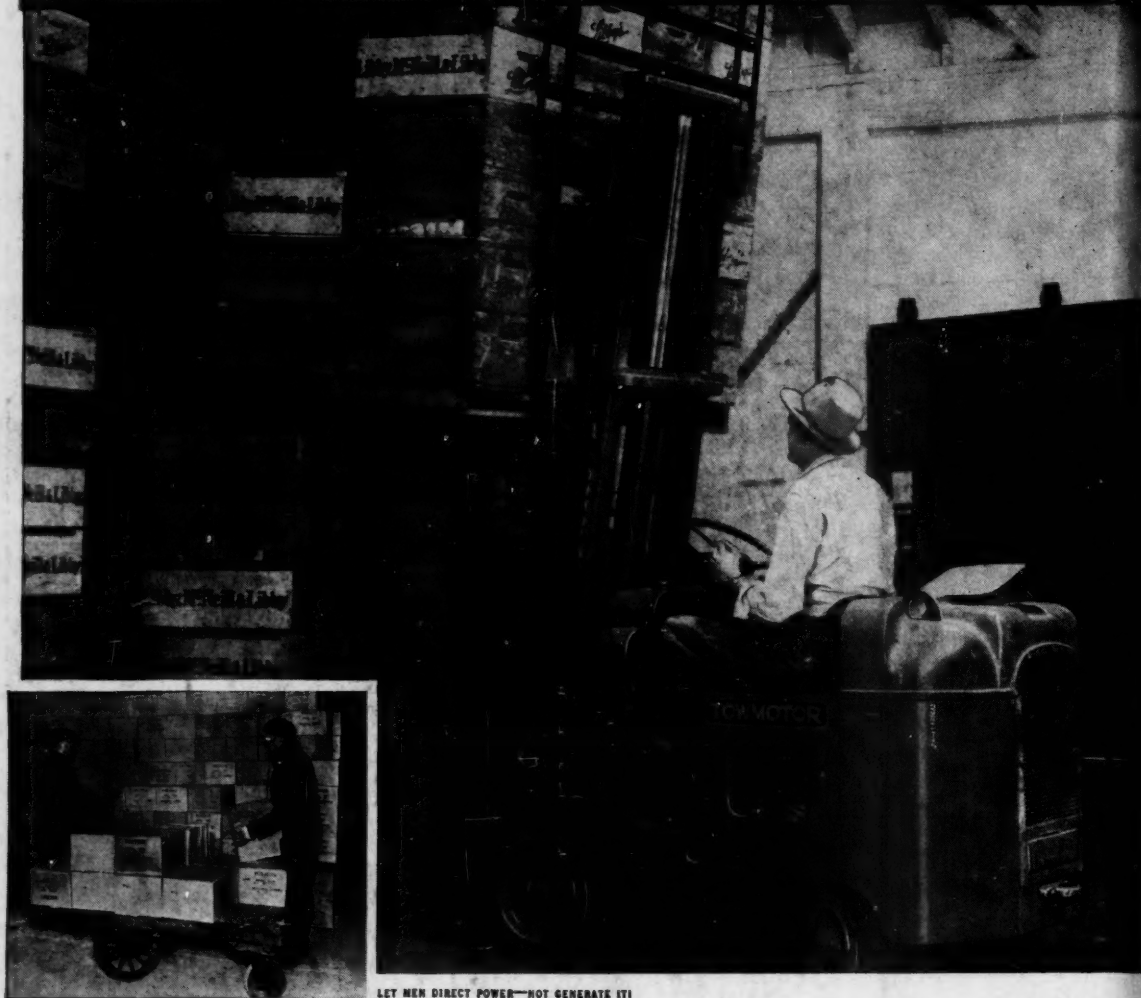
Mathews Conveyor Company

ELLWOOD CITY, PENNSYLVANIA



HANDLING+Processing+HANDLING+Assembling+HANDLING+Packing+HANDLING+Storage+HANDLING

HANDLING—the Common Denominator of PRODUCTION



LET MEN DIRECT POWER—NOT GENERATE IT!

Cubic transportation—Lifting and placing as well as carrying—is essential to efficient handling. *Where* a product is handled is just as important as *how* it is handled.

Towmotor, capable of moving materials in any plane from floor level to a 20 foot height, provides a means of utilizing all available space. The Towmotor DATA FILE contains details. Your copy is ready now.



TOWMOTOR

THE ONE-MAN-GANG

TOWMOTOR CORPORATION • DIV. 12, 1225 E. 152ND STREET, CLEVELAND 10, OHIO